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AFRICAN HANDBOOKS: 8

*Committee on African Studies, University of Pennsylvania*

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DRUG PLANTS  
OF  
AFRICA

*By*

Thomas S. Githens, M.D.

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## PREFACE

Periodically in the course of development of most fields of human endeavor, there accumulates such a vast body of information that the need arises for someone to undertake the task of collating and synthesizing it. An example of this trend and the manner in which the need has been met is furnished by the subject matter of this volume.

For countless generations the inhabitants of Africa have developed a store of empirical information—and misinformation—concerning the therapeutic values of their native plants. During the past century much of this information has been scrutinized in the light of modern chemistry and physiology. In still more recent times there have appeared numerous books and articles dealing with special categories of drug plants or with the plants of a particular country or a restricted portion of the continent.

Heretofore there has been no comprehensive attempt to compile the results of these individual studies or to evaluate the contribution which Africa has made to our understanding of the poisonous or curative properties of plants.

The author of this handbook is eminently well qualified by training and experience for the task in hand. For nine years he was a member of the Department of Physiology and Pharmacology of the Rockefeller Institute, and for nearly a quarter of a century he served as Chief Pharmacist, first of the H. K. Mulford Company, later the Sharp and Dohme Company at Glendolen, Pennsylvania. To a broad knowledge of the plant resources of Africa he brings a keen insight of the pharmaceutical properties of plants. Dr. Githens is to be congratulated on having had the courage to approach the task of sifting and collating a prodigious amount of material, checking inconsistencies, eliminating duplications, and presenting us with a useful account of the medicinal plants of the Dark Continent.

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## Chapter I

### INTRODUCTION

The study of the therapeutic uses of plants by primitive people who are ignorant of the nature and causes of bodily ailments is both a fascinating and an extremely difficult task. The reason some plants come to be selected by the tribal medicine men, while others apparently more worthy of notice are neglected, is not easy to determine. As primitive people lack criteria by which the effect of drugs on the body can be studied, it is but natural that the plants growing wild in any locality should be tested on the sick, and if the patient should happen to improve, the drug is used again. In this way a very large number of plants, most of which have little or no special virtue, will come to be used by one tribe or another, and a complete list of plants used as drugs may include almost all the common plants of the vicinity. Most Americans know that a great many plants were so used by the American Indians and were adopted from them by the early settlers who could not obtain the drugs to which they had been accustomed in Europe. Clinical indications for many of these plants are described in detail in the early works on therapeutics published in this country, but very few are used as medicines today.

The reason for the use of some plants is evident. Members of the tribe observe that animals and men feeding on certain plants suffer disturbing or even fatal reactions and such are early recognized as poisons and often are employed as such. In some cases therapeutic virtues are found in doses too small to be dangerous, for example when these merely induce vomiting or purging. Plant parts causing irritation or inflammation on contact with the skin are soon identified and may be used as counterirritants to relieve deep-seated pain.

Often a strong odor or a bitter or pungent taste attracts attention. Plants having such are used both as flavors and as medicines. Thus the spices are found to relieve intestinal colic, and experience shows that certain aromatic plants as well as the fragrant balsams and the astringent barks are of value as wound dressings. Plants which induce vomiting or purging are used

in treating food poisoning and indigestion, and others, which cause sweating, are found to reduce fever.

Apart from such usages based on the observation of definite effects, the employment of plants as medicaments is mostly empirical and is frequently infused with a strong element of magic.

The belief in magic and witchcraft is universal among primitive people, and the medicine men who are employed to treat the sick and injured are commonly the same individuals who deal in magical charms and perform special rites to assure good crops, avoid threatened calamities, and promote recovery from adversity and illness brought on by offenses against the tribal gods or by the malevolence of witches or evil-minded neighbors. Most illnesses are considered to be at least partly due to such non-material influences, and magical charms designed to overcome them or to cast out evil spirits are inextricably woven with the use of methods designed to meet more practical ends. It is often impossible to determine whether a drug or a constituent of a mixture employed to combat a given symptom is used because of previous observation of beneficial action or because of its supposed magical powers.

The association of magic with medicine is well illustrated by the doctrine of "signatures" which persisted in this country and England to within a century. This taught that nature had provided a vegetable remedy for every ailment and had indicated by evident signs how each plant was to be used. Thus a plant like hepatica, with leaves lobed like the liver, was useful in disease of that organ; a plant with heart-shaped leaves was of value in cardiac disturbances. Saxifrage, which grows among broken rocks and was supposed to disintegrate them, would have a similar action on stones in the bladder. Such doctrines are evidently closely related to the African Natives' administration of owl's feathers to make the disease fly silently away, or of plants with swollen or bulbous roots to check emaciation.

The use of plant drugs by the Native tribes of Africa has followed the practices universal among primitive people and, for the reasons given, a very large number of plants are used as medicines by one tribe or another, over fourteen hundred species being included in the present study. As it would be quite impossible in the scope of a handbook to give each species a complete description, the most essential data in regard to each species are presented in the form of tables, more detailed descriptions being reserved for a few of the more important genera.

Many of the plants are used for the same purposes as the

same, or a closely related, species is used in scientific medicine, while an even larger number of evident value are almost entirely unknown outside of their native land and might with advantage be introduced into Western medicine. Some, as *Strophanthus* and *Strychnos*, although recognized as valuable medicines by scientific physicians, are used only as poisons by the Natives (page 24). These are included under "Drug Plants Used as Poisons" (Table 13).

A great many African drug plants have been studied chemically and physiologically, and their action on the animal body has confirmed their use by the Natives, or physiologically active components have been separated. There has been little clinical trial of these drugs by white doctors in Africa except among the Afrikanders. All such plants are listed as "Native Drug Plants of Probable Value" (Table 14).

Other plants valued by Native medicine men have been found inert by physiologic tests and contain no active constituents. Their use would seem to be based on faulty observation or possible magical association. Such plants are treated as "Native Drug Plants of Doubtful Value" (Table 15).

In spite of contact with medical missionaries and public health agencies, the medical practice of the Natives of most parts of Africa seems to have undergone little change, although plants introduced and now growing wild are used with the indigenous flora. Among the Mediterranean peoples of North Africa, where contact with Europe and Asia has existed from time immemorial and where the population is largely not Negroid in character, drugs and methods of treatment introduced from other regions assume great importance. The Arabs, Moors, and other races cultivate many drugs which are not natives of Africa or have become rare as wild plants. The more important of these are listed as "Cultivated Plants" (Tables 11, 12). Arab medicine is a varied combination of ancient Arab customs, modern European medicine, and native African usages. Their most important drugs, such as opium, cannabis, digitalis, and squill, are not used at all by the local Negro medicine men.

To avoid misunderstanding in the identification of plants in the ensuing pages, these are almost always referred to by their scientific names. As these are based on the Index Kewensis, authorities for species names seems unnecessary. These names are, however, not universally used, and to facilitate comparison with the works of other authors a table of synonyms of generic names is given (page 46). English names are employed only

when their application is clear. Such names are often ambiguous, many species, for example, are referred to as "thorn bush" or "thorn tree"; several of the *Amaryllids* are known as Natal lily; many pungent fruits are termed African pepper, etc. Native African and Arab names are omitted entirely, as these vary from one tribe to another and would apply only to a limited area. Even in the same tribe, several plants used for the same purpose but totally unrelated botanically are often called by the same name, so that a dictionary would be required to make the references complete.

As the physiologic action and medicinal properties of plants depend largely on the nature of their chemical components, it is advisable, for the benefit of those who are not familiar with plant chemistry, to describe those constituents on which drug activity depends. Chapter II will deal with the plants from this point of view, while Chapter III will present the use to which the various drugs are put by the African Natives. For readers who are not familiar with medical terms, a list of these with definitions will be found on page 49.

Many books and articles dealing with the drug plants of single colonies or special regions of Africa have been published, as will be seen by reference to the Bibliography at the end of this book. From these publications the author has derived most of the information in this Handbook. As far as he is aware, however, this is the first attempt to gather the medical botany of the entire continent into one volume. An attempt has been made to include all plants used extensively as medicines or poisons by any of the Native tribes, and detailed description has been sacrificed for completeness of coverage.

Much of the literary material referred to is not readily obtainable and it is hoped that this Handbook will stimulate interest in the little-known subject of African drug plants by presenting a general picture of their great variety and importance.

## Chapter II

# THE CHEMICAL BASIS FOR THE USE OF DRUG PLANTS

The therapeutic or medicinal activity of plants usually depends on the presence of what are known as "active principles," and some understanding of these is necessary in any study of the actions and uses of plants and plant parts as drugs. The chemistry of plants differs fundamentally from that of animals in one respect. In the chemistry and metabolism of animals a great similarity is observed among all those above the worms. All have muscles, fat, and skin of essentially similar character, all have digestive systems with similar digestive secretions, livers secreting bile, blood with red and white cells, etc. All of the bodily constituents have definite and well-known functions, and almost all of them are much the same in all higher forms. Characteristic individual constituents, such as the odorous secretions of the skunk and the venoms of poisonous snakes, are few in number. Among plants, on the contrary, such peculiar and characteristic constituents often dominate the chemical picture. All plants contain a structural framework based on cellulose and lignin, the vital cells contain protoplasm, such nutrients as sugars, starches, inulins, and chlorophyll which helps to form them. Most plants exhibit in addition substances having individual properties, and often having no known relation to the metabolism or functions of the organism as a whole, and differing completely from one plant to another. When such substances exert an influence on the structure or function of the animal body they are known as "active principles," and it is on the presence of such principles that the therapeutic value of plants depends. These principles vary widely in chemical composition, and many of them are useful in industry, for example the tannins, used in the preparation of leather; dyestuffs, such as indigo; fixed oils, used for lubrication; and volatile oils, valued by the cosmetic industry.

The principles of chief interest in medicine may be classified into several groups according to their chemical nature and their action on the animal body. Three of these groups comprise

constituents related to the three classes of nutrients—carbohydrates, fats and proteins—and serve as reserve food for the plants. In other groups the relation to the plant economy is obscure. Tannins, for example, deposited in the bark can hardly take any active part in the metabolic functions of a tree. The value to the plant of alkaloids, glucosides, and essential oils is also obscure.

#### MUCILAGES AND GUMS

These are non-nitrogenous compounds related to the carbohydrates and somewhat resembling starches in physical character. They are soluble in, or miscible with, water; they are bland and unirritating; they are not readily absorbed by the skin or by mucous membranes, and are not attacked by the digestive ferments. Their action is wholly local, being soothing, protective, and demulcent when applied or swallowed. Many of them may be obtained, often in a relatively pure state, as exudates from incisions in the bark of trees, while others are used as watery extracts of the plant or by applying the crushed leaves containing them.

The most important of the exudates is gum arabic, a product of several species of *Acacia*. This gum differs from most plant products in that it is not produced by the normal plant, but is induced by the action of a special microbe, *Bacterium acaciae*, on the trunk where the bark is injured or denuded. As all acacias are attacked by the same organism, the gum collected from different species is essentially similar. Gum arabic is not only used extensively by the whites and Natives in Africa, but is a very important article of export. Indian gum, which resembles gum arabic, is collected from *Anogeissus latifolius*, which has been introduced into the French colonies of West Africa. African tragacanth, from incisions in the bark of *Sterculia*; sarcocollin, which exudes from the bark of *Penaea* trees; and a gum from cuts in the unripe capsules of *Asphodelus microcarpus* are used for local applications. Many fruits contain gums, and largely through their presence act as laxatives or serve as emollient dressings. Those of several African trees, including the tamarind, mango, jujube, *Ximenia*, and several kinds of fig are examples.

The presence of mucilages characterizes most of the Malvaceae, and several species of mallow (*Malva*) and of marshmallow (*Hibiscus*) yield extracts from leaves and fruits which serve to soothe irritated mucous membranes of the throat and digestive tract, or

inflamed and painful skin. In North Africa, soothing preparations are also made from the leaves of borage and the root of the sweet flag (*Acorus calamus*), both of which are used similarly in Europe. Several species of *Alysicarpus*, *Commelina*, *Echinops*, *Grewia*, and *Portulaca* yield gums or mucilages and are used topically and internally.

#### FIXED OILS OR FATS

The fixed oils are so called because, in contrast to the volatile or essential oils, they do not distill at the temperature of boiling water. Chemically they consist of three molecules of fatty acid which form a sort of salt or ester with one molecule of glycerin. Most of these oils are edible, including palm oil, peanut oil, oil of sesame, Kenya butter (*Pentadesma*), and olive oil. These, as well as the fixed oils from *Balanites* (zachun oil), *Canarium*, *Trichilia*, and *Anona*, are used topically as emollients and ointment bases.

A few fixed oils, mostly characterized by strongly unsaturated fatty acids, are not readily digested or absorbed. Several such expressed from the seed of *Euphorbiaceae* act as cathartics. Of these the best known is castor oil (*Ricinus*) which acts as a mild laxative and can also be used as an emollient. Croton oil, however, acts as a drastic purge and can blister the skin. Physic nuts (*Jatropha curcas*) contain a similar oil. It is of interest to note that all three of these oils contain toxalbumins which must be destroyed by heat and removed before the oil is fit for use. Irritant and cathartic fixed oils are also obtained from *Excoecaria* and *Ximenia*.

Other fixed oils, found to be toxic to lower forms of animal life, are employed by Native tribes as antiparasitics and anthelmintics. Among these are oil of touloucuna (*Carapa procera*), martosa oil (*Melia*), and custard apple oil (*Anona*). In several instances the fixed oil is associated with a volatile oil or resin, and the mixture, as found in *Canarium* and *Moringa*, has combined emollient and counterirritant action.

An oil related to chaulmoogra oil is present in several species of *Oncoba* and is claimed to be likewise of value in leprosy.

#### TOXALBUMINS

These poisonous proteins are irritant substances commonly found only, or chiefly in the seed, which induce inflammation when applied to mucous membranes, such as those of the eye



or nose, and violent emesis and purgation when swallowed, as they are not digested or rendered inactive by the digestive juices. Several of these seeds, either as powder or as extracts, are applied to sluggish ulcers and even to congested eyes to induce an inflammatory reaction followed by healing. The seed of jequirity bean (*Abrus precatorius*), *Adenia venenata*, and related species of *Modecca*, *Cassia abusus*, and several crotons are used in this way. Less common is their use as ordeal, homicidal, or animal poisons. *Cucumis africanus* is thus employed in Tanganyika, *Phyllanthus engleri* in North Rhodesia, *Modecca digitata* in South Africa, and jequirity bean in India.<sup>1</sup> Several of these seeds have been used as anthelmintics, but the effective dose is so close to the toxic dose that the practice is not safe. It is thought, however, that the effectiveness of certain established taenicides, such as pumpkin seed, may depend on proteins. The presence of toxalbumins in castor oil, croton oil and jatropha oil has been referred to. The anthelmintic action of the latex of the papaw (*Carica*) is supposed to depend on a toxic protein as does the emetic action of *Ophiocaulon*.

#### GLUCOSIDES

The glucosides derive their name from the presence in the molecule of a hexose sugar, usually glucose, more rarely rhamnose or another. This can be split off by acids giving rise to bodies known as "genins," which are usually non-nitrogenous, more or less complex ring structures. They usually have the same general action as the original glucoside, but reduced or modified. In some instances, only the genin is active. Certain plant constituents, for example gallic acid and prussic acid, are usually present in glucosidic form, although also occurring in a free state. Such constituents will be considered with the corresponding glucosides. As the glucosides do not have any particular type of action, they will be taken up under separate headings.

**TANNINS.** The tannins are glucosides of gallic or protocatechuic acids. (So-called tannic acid is a glucose ester of gallic acid.) They, as well as their genins, have the property of precipitating proteins and mucus and constricting blood vessels. This astringent action gives them value in controlling hemorrhage, checking diarrhea, and as applications to wounds, ulcers, and deep burns, which are thereby covered with an impervious

<sup>1</sup> See page 24.

protective coating. Commercially they are employed in tanning leather, as mordants in dyeing, etc. They are among the most abundant of the active principles and are present in most trees and shrubs and in many herbs. In woody plants they are found chiefly in the bark, but abound also in roots, leaves, nuts, and unripe fruits. They are frequently associated with other principles. The application of particular tannins depends largely on their solubility in water and the readiness with which the more soluble genins are yielded on contact with the acid gastric juice. Thus the tannin of oak galls, being rather soluble, is of value for topical applications, but its effect in the lower bowel is limited. Kino, the tannin of *Pterocarpus*, is not readily absorbed and is of greater value in diarrhea and dysentery. Most of the tannin drugs are used by the African Natives both topically and internally. Hot or cold water extracts are usually administered for diarrhea, and similar extracts may be applied to wounds or ulcers, but more often the powdered root or bark or the crushed leaves are used as a dry dressing. Cold water extracts of the milder tannins are applied to the eyes to reduce congestion and relieve inflammation. The bark of many trees serves as a source of tannin. Among the more important of these are the thorn trees (*Acacia*), the mahogany tree (*Diospyros melanoxylon*), the cucumber trees (*Kigelia*), the mango (*Mangifera indica*), the cayor apples (*Parinarium*), the mangrove (*Rhizophora mangle*), the African tulip tree (*Spathodea*), and the artar root (*Xanthoxylum senegalense*). Several of these are or have been articles of export as are kino, the dried sap of *Pterocarpus erinaceus*, which grows on the west coast from Senegal to Angola, and nut galls, a globular swelling formed by the action of the gall fly on twigs of the gall oak (*Quercus infectoria*) which is common in certain parts of the Mediterranean region.

Several plants containing tannins are used by the Natives as vermifuges, but most of these contain other principles to which the effect is probably partly due. Although only a small fraction of the gallic acid split off from tannins is excreted by the kidneys, several tannin drugs are said to be of value in infections of the urinary tract.

**SAPONINS.** The saponins constitute a very large and diverse group of glucosides which have the property of causing foaming when added to water. They find an extensive use in shampoos, tooth pastes, and similar cosmetic preparations. Some have no marked action on the body, but many of them induce

nausea or vomiting. This is accompanied by increased secretion in the respiratory passages and greater fluidity of the mucus, leading to loosening of coughs or expectorant action. The nausea is often accompanied by sweating, leading to lowering of febrile temperature. Saponins are therefore used as emetics, expectorants, and febrifuges. Many saponins act on the gills of fish and thus interfere with respiration and are therefore used as fish poisons. A stream is dammed up and the crushed drug swished through the water until enough is dissolved to asphyxiate the fish, which rise to the surface and are easily caught. The flesh of the fish is, of course, not affected. A similar effect is produced on the skin of intestinal worms, and saponins may be effective as vermifuges. The foaming character also permits their use in shampoos to asphyxiate head lice and other skin parasites. A few saponins are locally irritant and act as purgatives. It is interesting to note, in view of the reputed virtue of the roots of *Smilax officinalis* as a remedy for syphilis in America, that the root of a related species, *S. kraussiana*, is used for the same purpose by the Natives of the Congo. Most saponins are not freely absorbed from the intestines, but some which are, form a special class termed sapotoxins. These interfere with cellular respiration throughout the body, causing death by weakening all vital functions. Sapotoxins are found in species of *Albizzia*, *Balanites*, *Entada*, *Phytolacca*, *Randia*, and *Tephrosia*.

**CARDIAC GLUCOSIDES.** This is a small but very important group of drugs which have a so-called digitalis action on the heart, as evidenced by loss of coördination in the beats of the different chambers, leading, in poisoning, to slowing of the heart followed by great irregularity and eventual stoppage.<sup>2</sup> Glucosides of this type are found in several African genera. The poisonous properties of most of these plants are recognized by the Natives, who have used them from ancient times as arrow poisons and ordeal poisons. Their usefulness as heart remedies, which has led to the introduction of several of them into Western medicine, is hardly known to the Native medicine men. Those used chiefly as arrow poisons include several species of *Acokanthera*, *Adenium*, *Strophanthus*, *Cerbera* (*Tanghinia*), *Nerium*, *Periploca*, and *Antiaris*. All but the last of these are related genera of the Apocynaceae. Used chiefly as ordeal poisons are two of the Leguminosae—*Erythrophleum* and *Gleditschia*

<sup>2</sup> The first sign of poisoning is usually nausea, which leads to the use of cardiac glucosides as emetics and expectorants.

(formerly *Erythrophleum*). Other plants in which cardiac glucosides have been found do not seem to be used as poisons. As with other toxic plants, several of these are employed both topically and internally in snake bite, perhaps on the theory that two poisons will counteract each other. This usage may be regarded as at least partly magic. Species of *Xysmalobium* and of *Gomphocarpus*, which contain a similar glucoside, but are not very toxic, are used as tonics in heart weakness and dropsy, and certain species of *Digitalis*, *Scilla*, and *Urginea* are gathered for export in North Africa and find limited employment, chiefly among the Arabs.

**ANTHELMINTIC GLUCOSIDES.** This small but valuable group contains glucosides with phloroglucin or a related compound as the genin. All of them have the power to kill or expel tape-worms, and they are used for this purpose by the Natives. Several of them are ferns, including *Aspidium*, *Cheilanthes*, *Dryopteris*, *Nephrodium*, and *Pellaea*. Three—*Embelia*, *Maesa*, and *Myrsine*—belong to the Myrsinaceae. Several of these show glucoside-resin combinations, as do species of *Albizzia*, *Brayera*, *Celosia*, *Jasminum*, *Mallotus*, *Phytolacca*, and *Rumex*. All of these are taeniocides, and in all the action may be partly or chiefly due to the resin.

**CYANOGEN GLUCOSIDES.** Several glucosides on contact with water yield cyanides, having the odor of bitter almonds. The glucoside *Amygdalin* is present in bitter almond (*Prunus amygdala amara*), and in many other Rosaceae, as well as in certain varieties of lima bean (*Phaseolus lunatus*). Related compounds are present in the root of *Passiflora quadrangularis* and in species of *Dichapetalum* which are used as arrow poisons.

**SALICYLIC GLUCOSIDES.** Salicin, yielding salicylic acid and of value in rheumatism, is the active agent in the twigs of the African willow (*Salix capensis*), which is used for the treatment of rheumatism by Natives all over the continent. Salicin is also present in the leaves of *Leucadendron concinnum* of South Africa, employed as a febrifuge, and in those of *Alsodeia monticola*, used for treating syphilis in the Cameroon.

**GLUCOSIDIC DYES.** Dyestuffs, chiefly quercetin and alizarin, are present in several African drugs, but probably take no part in their action. Among them are species of *Curcuma*, *Oldenlandia*, *Indigofera*, *Paeonia*, *Morinda*, *Jasminum*, *Rubia*, *Ruta*, and *Vitex*.

**NEUROTOXIC GLUCOSIDES.** In contrast to the alkaloids, very few glucosides exert a marked influence on the central nervous

system. Kellin, the glucoside of toothache wort (*Ammi visnaga*), is narcotic, and its soothing quality, together with the action of a carminative oil, leads to use of the drug to relieve renal and intestinal colic and other pains.

VERNONIN, from batiator root (*Vernonia nigriflora*), has a paralyzant action on the motor centers as well as a digitalis action on the heart, but this action does not influence its use. Certain species of *Gomphocarpus* are said to contain *cynanchotoxin*, which causes cerebral convulsions, but the therapeutic action depends on uzarin, a cardiac glucoside. *Byrsocarpus orientalis* of Madagascar, which appears to be used only as a poison, also contains a convulsant glucoside. Toxic glucosides are also reported in species of *Cynanchum*, *Funtumia* and *Xanthoxylum*.

#### ALKALOIDS

These compounds derive their name from the fact that, like alkalis, they combine with acids to form salt-like compounds. They resemble ammonia in containing trivalent nitrogen atoms which become pentavalent in the presence of acids, the other valencies combining with the acid radicle. The more active alkaloids are among the most potent vegetable poisons, but the greater number, although having some evident effect on the body, can be taken in relatively large dose without danger. Plants or drugs representing the more active alkaloids are used by the African Natives as poisons more than they are as drugs. The valuable tonic action of small doses of nux vomica (*Strychnos*) which contains the alkaloid strychnine does not seem to have been recognized by the medicine men, and although glaucoma is not uncommon in Africa, calabar bean (*Physostigma*), which is one of the most valued remedies for this condition, is not thus used by Natives, if indeed they recognize its symptoms. Many drugs contain alkaloids in association with another principle to which their effectiveness in certain conditions is to be ascribed, for example the control of diarrhea in drugs with tannins. In most cases, however, the alkaloid is the chief principle.

The more toxic alkaloids generally exert their chief action on the nerve centers or on the sympathetic nervous system, and their use by the Natives reflects these actions. Several act as hypnotics or narcotics, for example those of opium (*Papaver somniferum*), henbane (*Hyoscyamus*), and thorn apple (*Datura*), and may be used as intoxicants as well as for the relief of pain and insomnia. Others, such as *Cola* and *Corynanthe*, stimulate the brain or spinal cord and relieve depressed nervous states. This effect is

not readily distinguished from a general tonic action. More often, however, the chief effect of alkaloids is on the nervous control of the viscera, and the stimulating or quieting effect on the bowel movements of such plant drugs as *Boerhaavia* and *Papaver* is utilized in the treatment of sluggishness or diarrhea. A dilating action on the bronchi or stimulation of bronchial secretions makes certain alkaloids useful as antiasthmatics or as expectorants (*Anacyclus*, *Hyoscyamus*); others are supposed to increase the flow of bile (*Lantana*) or to regulate the functions of the uterus, emmenagogue action (*Withania*). The toxic action of alkaloidal drugs is availed of in their use as vermifuges (*Punica*, *Spigelia*), arrow poisons (*Haemanthus*, *Strychnos*), fish poisons (*Dioscorea*, *Sophora*), and for the destruction of lice and other parasites (*Delphinium*, *Gloriosa*). Toxic alkaloidal plants are also used in the treatment of snake bite (*Cassythia*, *Clivia*), perhaps with the idea of driving out one poison with another, which, as already mentioned, is a common practice in magical therapy. Of the genera containing toxic alkaloids, *Strychnos* deserves special mention because while most of the species (*S. icaja*, *S. kipapa*) contain the convulsant strychnine, a few (*S. Henningsii*) contain paralyzant alkaloids like curare, and others (*S. innocua*) contain no toxic principles. Several of the drugs containing narcotic alkaloids are employed as soothing dressings (*Datura*, *Hyoscyamus*), while others with irritant alkaloids are applied to induce healing (*Buphane*, *Sarcocephalus*).

A number of the less toxic alkaloids, such as sparteine and caffeine (*Anagyris*, *Cola*), augment the renal secretion either by increasing the blood flow through the kidneys or by a more direct action and are therefore used as diuretics and in the treatment of dropsy. Several alkaloids (*Gaertnera*, *Khaya*) are believed to reduce febrile temperatures, and to some of these (*Corynanthe*, *Crossopteryx*) is ascribed an antiperiodic action on malaria, like that of quinine.

The value of these drugs in the specific treatment of other infections is not readily explained, but they are used in such conditions as rheumatism (*Alstonia*), gonorrhoea (*Artabotrys*), leprosy (*Crinum* and other Amaryllidaceae) and even anthrax (*Cluytia*).

Most of the alkaloids have a bitter taste, and many of them have little or no effect on the bodily functions and may be classed with the simple bitters, having only the tonic effect relevant to increased appetite and improved digestion (*Mimosa*, *Trigonella*). A special type of alkaloid known as piperine is the pungent principle of the seed of black pepper (*Piper*), Melagueta pepper

(*Amomum*), and Guinea pepper (*Xylopia*), which act in the same manner.

#### ESSENTIAL OILS

Essential oils are volatile and commonly odorous liquids to which the scents of flowers and plants are commonly due. Chemically they are usually non-nitrogenous principles containing a six-carbon ring. Most of them are liquid, but a few, such as camphor, thymol, and menthol, are solids. Resins and terpenes are more complex condensation products of similar rings. Most of the essential oils have a pleasant odor and are widely used as flavors. Anise, allspice, dill, and others are cultivated solely for this purpose. Many of the essential oils have the power to regulate the intestinal movements, preventing or controlling violent contractions and aiding the ordered flow of the food through the bowel. This "carminative" action leads to the widespread use of plants containing them as condiments with food and to relieve colicky pain. A similar action on the uterus renders them of value as emmenagogues.

Several of the oils which are excreted unchanged, especially in the mucus of the respiratory tract and by the kidneys, are of value in the treatment of coughs and colds (*Asmena*, *Ballota*) and of urinary infections (*Osyris*, *Petroselinum*). Excretion by the kidneys may lead to increased urinary flow (*Rosmarinus*). Oils which are less well absorbed may be of value as vermifuges. This is certainly true of oil of *Chenopodium*, which is one of our most reliable remedies for roundworm and hookworm.

Many of the essential oils have the power to check bacterial growth and are widely used as food preservatives, for example in spiced fruits, and plants containing them are used by the Natives in the treatment of local and even general infections and as wound dressings (*Calophyllum*, *Eugenia*). The more irritant oils are used as rubefacients (*Amomum*, *Xanthoxylum*) and as snuff (*Ajuga*, *Lantana*).

Plants having essential oils associated with bitters are discussed later under that heading.

#### RESINS

The resins differ from the essential oils in being usually solid, only slightly volatile, and more likely to be pungent or burning in flavor than aromatic. Many of them are extremely irritating, acting as counterirritants (*Piper*, *Xylopia*) or even as vesicants (*Anacardium*), and causing vomiting and purging if swallowed

in large dose. Most resins are associated in the plant with other principles such as essential oils, glucosides, or alkaloids, and it is not always possible to determine, when the whole drug is used, to which constituent any given effect is due. Several resins are combined with gums forming gum-resins, which are soothing rather than irritating. Some of the more important resins are collected in a relatively pure state as exudates from incisions in the bark of trees (*Canarium*, *Copaifera*, *Pistacia*). Many gum-resins are similarly collected (*Anacardium*, *Boswellia*, *Commiphora*, *Eriodendron*, *Mangifera*, *Moringa*, *Ocina*, *Symphonia*). Tannin is also present in the exudate in *Eriodendron* and *Pterocarpus*. Resins may form a constituent of a milky latex, which is collected and dried (*Calotropis*, *Carpodinus*, *Riciodendron*), while in *Mallotus* the hairs of the fruit are resinous.

Many of the resins resemble the essential oils in their actions and, like these, are used as carminatives (*Amomum*, *Piper*, *Zingiber*), in the treatment of respiratory disorders and infections of the urinary tract (*Albizzia*, *Fagara*). Of great importance are the purgative resins (*Ipomea*) which are used both by Natives and by white physicians, as are a few narcotic and sedative resins, of which the most valuable is *Cannabis* or haschisch.

The more poisonous members of the group, used as arrow poisons (*Dichapetalum*), cause a violent local reaction and even fatal poisoning. Their slight solubility leads also to their use as vermifuges (*Brayera*, *Albizzia*) and for the destruction of skin parasites (*Rhinacanthus*, *Symphonia*).

The adhesive quality of resins gives them value as wound dressings and as fillings for the cavities of carious teeth (*Mallotus*, *Pistacia*).

#### SULPHUR OILS

These are liquids, resembling the essential oils in being volatile, but differing from them in composition, being sulphur compounds. Oils similar to that of mustard are present in the fruit and seed of many of the Cruciferae and Capparidaceae, including *Sinapis*, *Lepidium*, *Capparis*, *Boscia*, *Buchholzia*, *Cleome*, *Courbomia*, *Crataeva*, *Maerua*, and *Moringa*. Other sulphur oils are found in *Capsicum*, *Petiveria*, *Salvadora*, and *Thapsia*. These oils are all extremely irritating, causing reddening and even vesication on the skin, and acting as carminatives in small dose and as emetics in large. They are used for many purposes by the Native medicine men, but it is doubtful whether any effectiveness in such conditions as rheumatism, jaundice, large



spleen, or yellow fever is to be ascribed to anything but a semi-magical idea that a "strong medicine" will have a correspondingly marked effect.

### BITTERS

The bitters constitute a large group of substances having no general chemical relationship and with nothing in common but the property of a bitter taste. As already stated, most alkaloids have a bitter taste and many are used solely for that reason. Many of the bitters are glucosides, and these will be included here as well as those of other composition, known loosely as "amaroids." None of the amaroids or glucosidal bitters is poisonous, although usually given in small dose. Resinous bitters are similarly used but are likely to be somewhat irritant. Bitters have the effect of increasing the appetite and improving digestion, and in this way they act as general tonics, help to control diarrhea resulting from food poisoning, and aid in throwing off colds and other infections. The bitter taste attracts attention and, since all primitive and ignorant people anticipate effects from strong-tasting medicine, all sorts of virtues have been ascribed to these drugs, on what might be called a magical basis. Many of the drugs which are used as bitters contain also other active principles, such as resins and essential oils, tannins, and alkaloids. Although in Western medicine the presence of such substances modifies the method of use, it seems to make little difference in the practices of Native medicine men. The healing action of certain bitters on wounds is recognized in Western medicine but, like the vermifuge power, the explanation is obscure.

### ANTHRAQUINONE CATHARTICS

These include drugs much employed in both Western and Native medicine. The principles may occur uncombined or as glucosides, but there is no difference in the action, which is a rather mild purgation. The most important genera containing these bodies are *Cassia*, of which some twenty species yield leaves known as senna, and *Aloe*, from which a drug is prepared by drying the juice which flows from the stumps of the fleshy radical leaves. At least seventeen species are utilized in this way. Glucosides yielding cathartic quinones are present in *Ecballium*, *Emex*, *Globularia*, *Rhamnus*, and *Rumex*, all of which find use as cathartics by the Natives. Many of these drugs, especially the leaves of *Cassia*, *Rhinacanthus* and *Globularia*, are used as dress-

ings for burns and other skin lesions. The pods of several species of *Cassia* also contain emodin, while the bark and other parts may yield tannin.

In several plants anthraquinone cathartics are associated with cathartic resins, as in the fruits of certain cucurbits (*Citrullus*, *Cucumis*, *Luffa*, *Momordica*) and in the roots of *Convolvulaceae* (*Convolvulus*, *Ipomea*). In these the resin is the more active constituent.

### MISCELLANEOUS PRINCIPLES

Many active principles, some of considerable therapeutic importance, do not fall into any of the above classes.

ROTENONE, which is useful as an insecticide and vermifuge, is found in species of *Lonchocarpus*, *Milletia*, and *Tephrosia*.

SANTONIN, of value against roundworms, is the anthelmintic principle of *Artemisia judaica* and other members of this genus.

KOSOTOXIN and related principles, which are taeniocides, are usually associated with resins and are held by some chemists to be resinous in nature. They are present in *Albizzia*, *Brayera*, *Celosia*, *Jasminum*, *Mallotus*, *Phytolacca*, and *Rumex*.

The same doubt as to their resinous character applies to the toxic principles of *Calotropis*, *Dichapetalum*, and *Euphorbia*.

Pungent principles, such as capsaicin of *Capsicum*, gingerol of *Zingiber*, and those of *Moringa* and *Zantedeschia*, are probably simple compounds, unlike piperine, which is alkaloidal. The same is true of cotyledontoxine, the principle of *Cotyledon*, which induces paralysis and is used in the treatment of epilepsy.

An oily liquid, anemonol, which yields crystalline anemonin on exposure to the air, renders many Ranunculaceae extremely poisonous. The plants containing it—species of *Anemone*, *Clematis*, *Knowltonia*, and *Ranunculus*—are used as stimulant ulcer dressings, to destroy skin tumors and the lesions of leprosy, as vesicants, and to induce sneezing. A similar principle, Cardol, is present in the fruit of *Semecarpus*.

The toxicity of certain plants does not appear to have been accounted for by the discovery of any toxic constituent. These include species of *Mareya*, *Melianthus*, *Obetia*, *Secamone*, *Synadenium*, *Tacca*, *Treculia*, and *Turraea*.

The presence of oxalic acid in *Alyxia*, *Begonia*, *Bryophytum*, and *Oxalis* leads to their use as appetizers and to that of the last-named as a vermifuge.

Digestive ferments are present in the fruits and juices of *Ficus* and *Carica* and aid their action as applications to skin lesions and as vermifuges.

It will be observed in Tables 4 to 10 that several genera are included in more than one. This is because a number of active principles are often associated in the same plant. Although these are often of the same type—opium, for example, containing as many as ten alkaloids, cinchona bark at least five, and *Buphane* three or more—different types are frequently associated also. A particular principle may occur in one part of a plant and another type in another, as in several species of *Cassia*, or both may be found together, as the resin and tannin in the latex of *Pterocarpus*. Resins and essential oils are generally associated, and often found with other principles. Alkaloids are rarely found with glucosides, but often with bitters.

It will also be noted that the plants are listed by genera and not by species. This is possible because plants of the same genus generally are characterized by the same type of principle. Thus all species of *Cassia* and of *Aloe* yield quinone cathartics, all the species of *Strophanthus* and *Acokanthera* have cardiac glucosides. Even when the identical principle is not present in all members of a genus, the type is commonly the same. Thus all species of *Amomum* show essential oils, although the composition of the oil is not the same in all. All species of *Datura*, of *Solanum*, or of *Strychnos* contain alkaloids, although the alkaloids differ from one to another species. Genera such as *Vernonia*, in which some species contain alkaloids and others glucosides, are very few.

This tendency of one type of principle to extend throughout a genus extends in some cases to the natural orders. A few examples will suffice. Most Malvaceae are characterized by the presence of mucilages, Geraniaceae and Cupuliferae by tannins, Pinaceae by resins, the leaves of Labiatae and Santalaceae and the seed of Umbelliferae by essential oils. The bulbs of Amaryllidaceae, the latex of Papaveraceae and of Berberidaceae yield alkaloids, while many Apocynaceae contain cardiac glucosides.

## Chapter III

### UTILIZATION OF DRUG PLANTS

The drug plants of Africa may be divided for convenience of study into the following four groups:

1. Plants which are more used in another connection and the medicinal use of which is of secondary importance. It will be sufficient for our purposes to do little more than list these.

2. Plants which are not natives of Africa, or are less grown in Africa than in South Europe or Asia, but are cultivated for local use or for export. In this group will be included those plants which are little if at all used by the Native medicine men. These also will not receive extensive discussion.

3. Plants which are used by the Natives chiefly as arrow poisons, or as ordeal or homicidal poisons. These have received more detailed chemical and pharmacodynamic study than drugs of the fourth group, and several of them have been introduced into Western medicine and now rank among our most important medicaments.

4. Native and introduced plants used by the Native medicine men in the treatment of bodily ailments. Such plants are numbered by the hundreds. A few, such as aloes and senna, have been employed in Western medicine for centuries, having been introduced chiefly by the Arabs. Many have been tried to a more limited extent by European physicians stationed in Africa and, being found of value, have been exported to Europe and studied by chemists and pharmacologists, but very few have found a lasting or extensive use. Fish poisons, being commonly used also as medicines, will be placed in this group rather than in group 3.

#### DRUG PLANTS HAVING OTHER COMMERCIAL USES

Most of the plants included in this group are not limited to Africa, and most of them are grown more extensively elsewhere. They are largely limited to the coastal regions of North and East Africa. Many of the North African species are found also in other Mediterranean lands, and it is uncertain whether they are indigenous or were introduced centuries ago by the Arabs or by settlers from southern Europe or Arabia.

By far the largest class are the spices and aromatics, which are used for flavoring food, in toilet preparations, and as preservatives and insect repellents, as well as medicinally. Many of them are used in Europe as medicaments, internally for various gastroenteric disturbances, especially colic and flatulence, and topically as counterirritants. Among the more important of such plants grown both in North Africa and Southern Europe are dill (*Anethum graveolens*); coriander (*Coriandrum sativum*); cumin (*Cuminum cyminum*), of which 1,300 tons were exported from Morocco in 1911; lavender (*Lavandula vera*); bitter almond (*Prunus amygdala amara*); several species of mint (*Mentha aquatica*, *M. rotundifolia*, *M. sylvestris*); marjoram (*Origanum majorana*); hoarhound (*Marrubium vulgare*); anise (*Pimpinella anisum*); thyme (*Thymus vulgaris*); and rosemary (*Rosmarinus officinalis*). Common to several tropical regions but mostly indigenous to East Indian islands are cinnamon (*Cinnamomum zeylanicum*), which is cultivated throughout tropical Africa; cardamom (*Elettaria repens*), grown in West Africa; cloves (*Eugenia caryophyllata*), the chief export crop of Madagascar and Zanzibar, nutmeg (*Myristica fragrans*), grown also in Madagascar and Zanzibar; and allspice (*Pimenta officinalis*), exported from Tunisia as well as from Zanzibar. Red pepper (*Capsicum annum*) and ginger (*Zingiber officinale*), introduced from tropical Asia, are cultivated throughout Africa, and many tons of each are exported annually.

Some native plants which are little if at all cultivated elsewhere are valued as aromatics or condiments and are used extensively by the Natives for flavoring food and to a less extent as medicaments and as articles of export. Among these are several species of *Amomum*, for example, grains of paradise or melagueta pepper (*A. Melegueta*) and false cardamom (*A. stipulatum*), both of West Africa, and Madagascar cardamom (*A. angustifolium*) of Madagascar. Similar in use are black pepper (*Piper nigrum*) cultivated from Asia, and the related indigenous plants, Ashanti pepper (*P. guineense*), wild black pepper (*P. umbellatum*) of West Africa; African cubebs (*P. Clusii*) of tropical Africa; and Guinea pepper (*Xylopia ethiopica*) grown everywhere. Similar in properties to cloves is Guinea cloves (*Eugenia owariensis*).

Another group of plants used chiefly as mild stimulants, but having medicinal properties, are those yielding caffeine, including the native Kola (*Cola acuminata*) which grows wild

and is also cultivated in West Africa; coffee, of which there are three species widely grown—two native (*C. liberica*, *C. robusta*) and one introduced from Asia (*C. arabica*); and tea (*Thea sinensis*) introduced from China into British East Africa.<sup>1</sup>

Also of importance are plants cultivated chiefly as foods, but a part of which (often not the food) is used medicinally. Included here are the peachtree (*Amygdalus persica*) the leaves of which are used as a wound dressing in South Africa; parsley (*Petroselinum sativum*) whose root is employed to relieve dysuria; pomegranate (*Punica granatum*) the bark of which is taeniocidal; pumpkin (*Cucurbita pepo*) seed, also used for tapeworm; mango tree (*Mangifera indica*) the leaves of which contain tannin; papaw (*Carica papaya*) the leaves and sap being employed on skin lesions and as vermifuges. Two trees, the fruits of which serve as food, as laxatives, and as the basis of poultices, may also be mentioned here: the fig (*Ficus carica*) and the tamarind (*Tamarindus indicus*).

Certain plant constituents used commercially for entirely different purposes are occasionally employed medicinally. The fixed oils of cottonseed (*Gossypium herbaceum*), of benniseed (*Sesamum indicum*), and of other plants are applied as emollients and mild laxatives. The gum-resins of benzoin (*Styrax benzoin*), myrrh (*Commiphora myrrha*), Bdellium (*C. africana*), Egyptian bdellium or doom palm (*Hyphaene thebaica*), and South African bdellium (*Othonna furcata*), are exported for use in toilet preparations and incense, but have a limited medicinal use as wound dressings, mouth washes, and febrifuges. Similar exudations exported for use chiefly as varnishes, include Bombay copal (*Trachylobium hornemannium*), African gutta-percha (*Mimusops schimperi*, *M. kummel*), mastic (*Pistacia lentiscus*), and gum-resins from several species of *Symphonia*. All these are employed as surgical splints or dressings.

A few plants exported as dyes have collateral medicinal value. The root of madder (*Rubia tinctorum*) is thought by the Arabs to have a cholagogue action, the flowers of African saffron (*Carthamnus tinctorius*) act as a cathartic, the roots of turmeric saffron (*Curcuma longa*) and the leaves of henna (*Lawsonia inermis*) meet many indications both topically and internally. More important in their therapeutic indications are certain plant products containing tannins, used in the leather industry.

<sup>1</sup> These have been discussed in African Handbook No. 3 of this series—*The Food Resources of Africa*.

The best known of these is the nut gall, induced by the action of a gall fly on the gall oak (*Quercus infectoria*) of North Africa, which is used as an astringent.

#### DRUG PLANTS CULTIVATED IN AFRICA

Many drug plants which are not indigenous have been cultivated in Africa for many years, chiefly by Arabs and by white settlers, but also by the Negro tribes. Some of these have escaped from gardens and, growing wild, are gathered by the Natives from field and forest. Some of the plants which are now cultivated may be indigenous to Africa as well as to southern Europe or Asia.

From the commercial and historical standpoint, by far the most important of the cultivated drug plants is the opium poppy (*Papaver somniferum*) which was introduced into Egypt and other regions along the Mediterranean from Asia centuries ago. This was formerly a very important export crop in these countries, but international regulation of traffic in narcotics has reduced its cultivation to a small percentage of its former size. Opium is still grown for export under regulation and is used to some extent by the Arabs themselves, although the Moslem religion strictly forbids such indulgence. With the disappearance of the opium trade, another narcotic, also introduced long ago from Asia, namely, haschisch (*Cannabis indica*), has increased in importance. This is used by the Arabs, largely by smoking, recalling our own efforts to control the use of marihuana cigarettes made from the same drug. A third narcotic, absinthe (*Artemisia absinthium*), introduced from southern Europe, is cultivated and esteemed as a drink by the Arabs, and is also exported to France.

Other plants which have been brought from southern Europe and are cultivated by the Arabs of Algeria, Tunis, and Morocco, both for their own use and for export, include borage (*Borago officinalis*), of which twenty tons are exported annually from Algeria where it now grows wild; stavesacre (*Delphinium staphisagria*), used as an antiparasitic by the Arabs; marigold (*Calendula officinalis*); mezereon (*Daphne mezereum*), the bark of which is esteemed in Europe as an alterative, four tons being exported yearly from Algeria; oleander (*Nerium oleander*), which has an action on the heart like that of digitalis, but is used only topically for itch by Arab doctors; rue (*Ruta grave-*

*olens*), used as a febrifuge; and squirting cucumber (*Ecballium elaterium*), the purgative action of which is well known.

Drug plants from tropical Asia are grown in the tropical regions of Africa. The tree known as Pride of India (*Melia azedarach*) is cultivated extensively in the Belgian Congo and in West Africa, where the bark is used by the Natives as an anthelmintic. The croton oil plant (*Croton tiglium*) is grown in the Anglo-Egyptian Sudan and is there utilized as a drastic purge and anthelmintic. The jequirity (*Abrus precatorius*), the seed of which contains the toxic protein abrin, now grows wild in Senegal and in South Africa, where it is used topically by the Zulus in conjunctivitis and on skin lesions. The sweet flag (*Acorus calamus*) grows widely in North and West Africa, and a demulcent drink is prepared from the root by the Natives of Dahomey and elsewhere. Areca nut (*Areca catechu*) is cultivated in Zanzibar and Madagascar. *Mallotus philippensis*, which yields the resin kamala, is grown in Abyssinia and the French colonies, and chirata (*Swertia chirata*) from India is cultivated in South Africa.

A few drugs which appear to be indigenous are now derived chiefly from cultivated plants and are used by Arab and white doctors more than by the Native medicine men. Colocynth (*Citrullus colocynthis*) grows throughout Africa, and the purgative action of the fruit is well known to the Natives. It is exported from Anglo-Egyptian Sudan (over fifteen tons were sent to the United States in 1924) and from Cape Colony. The castor oil plant (*Ricinus communis*) also grows everywhere. The seeds are used as purgatives, but the method of expressing the fixed oil with heat, which destroys the toxalbumin, does not seem to be generally practised, which limits its usefulness. Castor oil is widely used commercially as a lubricant, and the seeds are exported from several of the African colonies. Black cumin (*Nigella sativa*, *N. damascena*) is cultivated and also grows wild in Algiers, Morocco, and Tunis, and is used by the Arabs as an addition to laxatives. White henbane (*Hyoscyamus alba*) is also chiefly an Arab remedy as a topical anodyne. Spanish pellitory (*Anacyclus Pyrethrum*) is chiefly an article of export (about five tons annually from Algeria).

Several medicinal plants which grow wild in North Africa as well as in southern Europe do not appear to be much used by the Natives, although they are gathered for export. These are squill (*Scilla maritima*), of which thirty tons are exported yearly



from Algeria; meadow saffron (*Colchicum autumnale*), exported to England for use in gout, an affliction hardly known in Africa; African ammoniac, a gum-resin from *Ferula tingitana* and pelitory (*Parietaria officinalis*).

Half a dozen plants which have been introduced into Africa have escaped from gardens and now flourish as common weeds. Several species of thorn apple (*Datura*) which contain mydriatic alkaloids related to those of belladonna now grow over large parts of the continent. Extracts of the leaves are used as dressings on painful wounds and as intoxicants. About three tons of the leaves of Jimson weed (*D. stramonium*) are exported from Algeria every year. Agrimony (*Agrimonia eupatoria*) also grows all over Africa. The leaves are used for tapeworm by the Zulus and Kaffirs of South Africa, while in the north Arab doctors use them for liver troubles. Fenugreek (*Trigonella fenum-graecum*) is established especially in the north, where Arabs consider it of value for coughs.

A few weeds from America also feature the native materia medica. American wormseed (*Chenopodium ambrosioides*) grows as a weed and is also cultivated everywhere. A hot decoction of the leaves and tops is used in South Africa for colds and intestinal colic, and the seeds are valued as an insecticide and vermifuge there and in Madagascar. It is exported from the Cape Province. Mexican poppy (*Argemone mexicana*) is also widely cultivated and has escaped in many places as a weed. It is used as a narcotic and anodyne, and the milky juice is applied topically on painful skin conditions, warts, and corneal opacities in West Africa and in Tanganyika. An extract from the leaves of Bermuda grass (*Eleusine indica*) is used for hemoptysis in the Cameroon.

Two trees of recent introduction are utilized chiefly if not entirely by white physicians. Peruvian bark (*Cinchona calisaya*) from South America is now being cultivated in Dahomey, Congo, and Angola, and serves as a local source of quinine in the struggle with malaria. More recently the Australian blue-gum tree (*Eucalyptus globulus*) has been planted in South Africa, lower Congo, and Senegal. The oil, eucalyptol, is a valued remedy for infections of the respiratory and urinary tracts.

#### PLANTS USED AS POISONS

Among the Native Africans, poisonous plants are used for poisoning arrows, for destroying vermin, as ordeal and homi-

cidal poisons, and as fish poisons. As almost all the plants used as ordeal and homicidal poisons also serve as arrow poisons, these will not be separated in the following discussion.

The use of poisoned arrows is universally practised by Natives of all tropical regions, but the variety of plants used is probably nowhere so great as in Africa. It is interesting to observe that several genera, for example *Strychnos*, have species with similar toxic properties in both tropical America and tropical Africa, and in both continents the Natives have discovered the availability of the species occurring in their own area. Many of the poisons are prepared for use by boiling the appropriate part of the plant and allowing evaporation to proceed until the mass is of a gummy consistency, when it is spread on the head of the arrow and allowed to dry. Very often a nonpoisonous or less poisonous constituent is added to increase the adhesiveness. In some plants the toxic principle is contained in a milky latex which dries into a sticky mass without concentration by heat. This is the case with *Euphorbias*, *Crotons* and *Adeniums*. These do not require additions to increase their adhesiveness, but as their action is largely a severe local irritation, it is common practice to mix them with a poison having a more active general toxic effect, such as *Acokanthera* or *Strophanthus*. The inflammatory action not only aids in disabling the victim, but through the local congestion hastens the absorption of the more active poison. The plants having little local action generally depend on cardiac glucosides or alkaloids for their effect, while those having a severe topical action contain toxic resins.

In order to understand the practice of ordeal by poison, one must realize to what a great extent the life of the African Native is ruled by his belief in magic. The failure of the crops, or an epidemic, is thought to be due to the evil machinations of some malevolent individual or witch casting a spell on the members of the tribe. The witch doctors or medicine men determine whom they suspect, and the unfortunate individual is forced, with much ceremonial and incantation, to drink a dose of the poison. If the ordeal is survived the suspect is cleared of the charge; if death results, it is the judgment of the tribal gods and sure evidence of guilt. The method of using the poison and the accompanying ritualistic observances differ markedly from tribe to tribe, but are along the line indicated. Poisons are also used by the more knowing members of the tribe as a means of removing enemies or obtaining revenge. Such use is more properly called homicidal poisoning.

Several genera of the Apocynaceae yield glucosides which slow and stop the heart. The most important of these is *Strophanthus*, woody vines the glucosides of which are known as strophanthins. Over a dozen species are used as arrow poisons. In West Africa, *S. hispidus* is most important, with *S. gratus*, *S. kombé*, and *S. sarmentosus* playing secondary roles. In the Congo and Rhodesia the same species are employed as well as *S. bracteatus*, *S. dewevrei*, *S. holosericeus*, *S. preussii*, and *S. tholloni*. In British East Africa, *S. kombé*, *S. courmonti*, and *S. emini*, and in Mozambique *S. petersianus* and *S. verrucosus*, are the favored forms. A related genus of shrubs and small trees, *Acokanthera*, contains similar glucosides, acocantherin and ouabain. Several species are found in central, West, and South Africa. *A. schimperi* is one of the important species and ranges from Abyssinia throughout British West Africa, growing mostly in the mountains. *A. abyssinica*, which is said to contain also a toxic alkaloid, abyssinnine, is largely limited to Ethiopia. *A. friesiorum* and *A. longiflora* are used in Tanganyika. *A. venenata* is probably the most widespread species, extending all over British East Africa, South Africa, and Congo. *A. spectabilis* grows in the forests of South Africa. Another genus containing similar glucosides is *Adenium*, small shrubs with milky juice which exudes from cuts in the bark and is allowed to dry. Most of the species are of the south and east, although one, *A. honghel*, grows from Senegal to Anglo-Egyptian Sudan. Three species, *A. coetanum*, *A. obesum*, and *A. somalense*, are used as poisons in East Africa; one, *A. multiflorum*, in southeast Africa; and another, *A. boehmianum*, from Angola to the Cape. In Madagascar is found a member of the same order, *Cerbera tanghin* (*Tanghinia*) or Madagascar ordeal bean. The seeds contain a toxic glucoside, tanghinin, and are used both as arrow poison and for ordeals. The leaves of the oleander, *Nerium oleander*, used as arrow poison in Mozambique, contain the cardiac glucosides, neriin and oleandrin.

Several plants belonging to other orders also yield cardiac glucosides, enabling them to be used as arrow or as ordeal poisons. The best known of these, *Erythrophleum*, is a genus of large trees, one species of which, sassy bark, *E. guineense*, is the chief ordeal poison of most of tropical Africa. The poison is prepared by boiling a carefully measured portion of the bark and giving a dose prescribed by the ritual. Two related species are used in the same way but to a less extent, *E. coumigo* of Madagascar and *Gleditschia africana* (formerly *E. africana*) of

British West Africa. All of the species contain the same glucoside, erythrophlein.

The milky juice of *Periploca nigrescens*, yielding the cardiac glucoside periplocin, is used as arrow poison in the Congo, and the related *Menabea venenata* finds employment as an ordeal poison in Madagascar. The upas tree of Java, *Antiaris toxicaria*, has been introduced and now grows wild in Uganda. The gum-resin holding the glucoside antiarin may be used as a poison by the Natives as it is in Java.

Many poison plants owe their toxicity to alkaloids. One of the most interesting of these, employed as an ordeal poison throughout western Africa, but less used on arrows, is a leguminous woody vine, the calabar bean or ordeal bean, *Physostigma venenosum*, the seed of which yields an alkaloid, physostigmine or eserine, which is widely used in Western medicine. Large amounts of the beans are exported from West Africa, twenty-nine tons from Sierra Leone alone in 1915. *Physostigma* induces violent contractions of the bowel, giving rise to agonizing cramps, which the victim is supposed to bear without evident signs of suffering. Larger doses kill by action on the heart. Similar alkaloids are contained in three other leguminous plants used as arrow poisons—*Detarium senegalense* of Senegal, and *Dioclea reflexa* and *Mucuna flagellipes* of central Africa.

Two other genera of the same order contain toxic constituents which give them value as arrow poisons. These are goat's rue, *Tephrosia*, containing a sapotoxin, tephrosin, and rattle pod, *Crotalaria*. The most important species is *T. vogellii*, which occurs throughout tropical Africa. Used in the Congo are *T. candida* and *T. toxicaria*, whole *T. lupulinifolia* and *T. macropoda* are used by the Zulus of South Africa. Two species of *Crotalaria*, *C. brevidens* and *C. ononoides*, are used as poisons in the Congo.

An important genus which is widely spread throughout the tropical world and supplies arrow poisons to the Natives and drugs to Western medicine, is *Strychnos*, which supplies the nuxvomica of India (from *S. nux-vomica*), the curare of South America (from *S. toxifera*) and includes the tieuté tree of Java (*S. tieute*), and several African species. The plants are trees or woody vines and yield toxic alkaloids, usually the convulsants strychnine or brucine, more rarely the paralyzant curarine. A few are not poisonous. The genus is less used as an arrow poison in Africa than in South America, but extracts of the bark

of the woody vines, *S. dewevrei*, *S. icaja*, and *S. kipapa*, are so employed in Congo, and *S. spinosa* is an ordeal poison in Mozambique.

Other plants used because of toxic alkaloids include African Amaryllis (*Buphane disticha*), the bulbs of which, containing haemanthine, are used as arrow and homicidal poison throughout tropical and southern Africa. The East African colic-root (*Dioscorea sansibarensis*) is a homicidal poison, and the East African iron-weed (*Vernonia hildebrandtii*) an arrow poison in Tanganyika and Kenya. The roots of two species of *Sarcocephalus*, containing a heart-depressing alkaloid, doundakine, are also used to poison arrows—doundake (*S. esculentus*) in West Africa and West African box-wood (*S. diderichii*) in the Congo.

In several species used as poisons the nature of the toxic principle is not perfectly certain, but in some of these it is probably a resin or associated with a resin.

The large genus of *Dichapetalum*, which extends over all of tropical and southern Africa, yields a narcotizing and a convulsant principle, said to be resins, and many species are used as arrow poisons and are dangerous to grazing cattle. Several of these shrubs, including *D. acuminatum*, *D. bussei*, *D. lolo*, *D. lujaei*, *D. mombongense*, and *D. mombuttense*, flourish in the Congo. In British East Africa *D. macrocarpum*, *D. mossambicense*, and *D. stuhlmanii* are found, while West Africa provides *D. toxicarium* and South Africa *D. cymosum* \* and *D. venenatum*.

Other poisons ascribed to resins include those of *Albizzia versicolor* of East Africa, *Anacardium occidentale*, *Combretum confertum*, and *C. grandiflorum* of the Congo, and *Calotropis procera* of the southern Sahara Desert.

Among those plants used as homicidal poisons, some owe their toxicity to toxalbumins. These include the fruits of *Cucumis aculeatus*, *C. africanus*, and *C. figarei* in Tanganyika and that of *C. myriocarpus*, the poison apple of South Africa, and the bark of *Phyllanthus engleri* in northern Rhodesia. The unripe berries of *Melia azederach*, used also for homicidal purposes, probably owe their toxicity to a protein, as they are not dangerous when cooked.

\* Recent studies by Marais (43) have isolated a toxic substance, monofluoroacetic acid, from *D. cymosum* of South Africa, which is poisonous to grazing cattle and sheep. This acid, made synthetically, has been tested as a rat poison by The U. S. Fish and Wildlife Service, but was considered too dangerous for general use.

Several plants of uncertain chemistry are used as poisons. The best known of these is probably hyena-poison, *Jatropha globosa* (*Hyenanche*), the root of which contains hyenanchine, said by some chemists to be alkaloidal, by others not. It is used, as the name implies, to poison meat to destroy hyenas. Similar in application is the bark of *Spondianthus preussii*, a tree found in the Cameroon and used as a rat poison. The juice of *Pali-sota barberi* is employed as an arrow poison by the Mombuttu tribe of southern Egyptian Sudan. The bark of *Securidaca longipedunculata* is an ordeal poison in the Congo, and that of *Elaeodendron croceum* in South Africa, while the root of *Gourbonia camporum* serves as a homicidal poison in Tanganyika.

Frequently added to the poisons already mentioned, but rarely used alone, is the milky juice, or latex, from two genera of Euphorbiaceae, *Euphorbia* and *Croton*. The juice contains acrid resins, and perhaps other principles which cause acute gastroenteritis if swallowed, and intense local inflammation and necrosis if injected. The species of *Euphorbia* are mostly spiny, leafless plants resembling cacti and exuding the latex from incisions in the stem. Of the species used as poisons, three—*E. calycina*, *E. candelabrum*, and *E. venifica*—are found all over tropical Africa; in West Africa, *E. poissoni* and *E. unispina* are used; in East Africa, *E. lathyris*, *E. neglecta*, *E. noxia*, and *E. tirucalli*; and in the South, *E. dinteri*, *E. metabelensis*, and *E. media*. The latex of the many species of *Croton* has similar properties, but only two species appear to be used as poisons, *C. lobatus* of tropical Africa and *C. oligandrus* in West Africa. An extract of the leaves of *Lasiosiphon krausii* is similarly employed in West Africa.

### FISH POISONS

Fish poisons, the use of which has been described (page 10), act either after absorption, by weakening the heart or muscles, or more commonly by so altering the surface of the gills that the fish are unable to breathe. Many saponins act in this way, and a few tannins and probably those resins which are used for the purpose. It is possible that all fish poisons affect the gills only and that the toxic principles which act on higher animals are not the effective agents. It has been shown that this is true of digitalis leaves, which kill by a topical effect and not by their action on the heart.

Possibly acting by paralytic or cardiac action are *Sophora tomentosa* of Mozambique and *Dioscorea rupicola* of South Africa, which contain toxic alkaloids, as well as *Adenium coetatum* and *A. multiflorum* of South Africa, which yield cardiac glucosides.

Action on the gills is almost certain in the saponin plants such as *Balanites egyptica*, *Mundulea suberosa*, *Tephrosia toxicaria*, and *T. vogellii* of tropical Africa; *Randia dumetorum* and *R. nilotica* of East Africa; *Barringtonia racemosa* of Madagascar; *Cynanchum sarcostemmoides* of Zanzibar; *Tetrapleura thoningi* of West Africa; *Tephrosia candida* of the Congo; and *T. macropoda* of South Africa. Probably dependent on the topical action of tannins are *Fluggea microcarpa* and *Pentaclethra macrophylla* of West Africa. Local action of a toxalbumin may account for the effectiveness of *Ophiocaulon cissampeloides* of West Africa. The method of action of *Morelia senegalensis* and *Xanthoxylum senegalense* of West Africa, of *Synadenium piscatorum* of East Africa, and of *Parkia biglobosa* of tropical Africa, is doubtful.

#### NATIVE DRUG PLANTS

The discussion of the medicinal uses of plants by the Native medicine men is rendered difficult by the great number of species involved and by the fact that, as already indicated, the purpose for which a particular plant is employed may differ widely from one tribe to another.

Many of the plants mentioned by various authors as native medicines are probably without therapeutic value and owe their continued use to chance or to a magical association. A large proportion of the drugs have, however, been studied chemically or physiologically by scientific investigators, and their action can be explained on a rational basis and their therapeutic value thus confirmed. In the absence of such studies we can assume the usefulness of a particular species which extends over a wide geographic area, when we find that it is similarly utilized in different parts of its range. Further, when different species of the same genus growing in different localities are used by unrelated tribes, we can with some assurance consider that a principle of value in the treatment of disease is common to all the species, and if a chemical analysis of one of the species is available, it can be considered highly probable that the same, or a closely related substance, is also present in the other species.

The fact that a given species, or different species of the same genus, is used for different purposes by various tribes, need not necessarily lead to doubt of its efficacy. Plants containing tannin, for example, are of value in checking diarrhea, as applications to congested mucous membranes, and as wound dressings. The fact that quinine is used by physicians for fever, malaria, influenza, coryza, and loss of appetite, need not raise doubts as to its efficacy in each of these conditions.

It is not easy to find a basis for arranging the drugs or plants deserving consideration. It would seem logical to arrange them according to their properties and uses, but as the same plant may contain several principles and be used for many different purposes, this entails a great deal of duplication. A strictly botanical arrangement is favored by most authors, but for those who are not botanists this has no special advantages and makes it difficult to find any special plant in tables.

As pointed out earlier, a large proportion of the common plants of any region are likely to be employed therapeutically by the medicine men of one or more tribes, and in the whole of Africa the total number to which medicinal properties are ascribed includes many hundred species. It is obviously impossible to give a detailed description of the uses and properties of so many, and it has been thought best to give first a brief description of each of the more important genera and then to present all the plants used medicinally in alphabetic tables<sup>2</sup> (page 62) showing the scientific name, the geographic distribution, the part of the plant utilized, the active principles, and the chief uses. Some additional information will be found in the tables under each type of principle.

The genera selected for special discussion will be arranged according to their most important active principle as described in Chapter II.

**GUMS AND MUCILAGES.** By far the most important genus yielding gum is *Acacia*, thorny shrubs and small trees, of the dry savannahs, the product of which has already been described (page 6). The chief sources of gum for export are *A. albida*, *A. arabica*, *A. senegal*, *A. seyal*, and *A. vereck*, all of which grow in the semi-desert belt extending across Africa from Senegal to Egypt. Gum from *A. tortilis* is exported from Egypt and Tripoli; *A. gummifera* from Morocco; that of *A. giraffae* and *A. horrida* from South Africa. Gathered for use by the Natives,

<sup>2</sup> Tables 11 to 15.



but less important as exports are the gums of *A. ehrenbergii* of the desert belt; *A. farnesiana* and *A. sieberiana* of the Congo; *A. catechu* of Mozambique; and *A. sassa* of Madagascar. The bark and fruit of several of these and of other species are used as astringents. Analyses report only tannin, which would seem to have a special irritant quality, as extracts of the bark of *A. caffra*, *A. gerrardi*, and *A. horrida* act as emetics, and those of *A. gummifera*, *A. sieberiana*, and *A. tortilis* are employed as vermifuges.

Another very important genus which provides both emollients and astringents is *Ficus*. The fruit of the fig tree (*F. carica*) is one of the chief exports of North Africa, while the latex of several species, such as *F. vogeliana* of tropical Africa, is a source of rubber. The fruit of most species contains mucilage associated with digestive ferments and is used as a dressing for boils and skin lesions and also as a cathartic. The latex and leaves of several species also contain digestive ferments and are used for indigestion and on skin lesions. Finally the bark is rich in tannin and useful in diarrhea and as a vermifuge and wound dressing.

The entire family Malvaceae is characterized by the presence of mucilage, and the leaves and roots of several mallows (*Malva*) and marshmallows (*Hibiscus*) are used as poultices and wound dressings and internally for coughs and urinary disorders.

**TANNINS.** The unripe fruit, bark, and leaves of the species of custard apple (*Anona*) contain tannin often associated with an inactive alkaloid, methyl-tyrosine, and a resin. Extracts are used as astringents in diarrhea. The leaves of *A. muricata* are said to be antispasmodic, while those of *A. chrysophylla* and *A. senegalensis* are considered so toxic that they are used as homicidal poisons. No antispasmodic or toxic properties have been found in any of the species studied by pharmacologists.

In the genus *Clerodendron*, bitter substances, chirettin and opheliac acid, are present with the tannin, and various parts of the plants are used as dressings for wounds, burns, and snake bites, and internally as vermifuges and expectorants.

In many species of *Grewia*, mucilage and tannin are widely distributed, making them useful as wound dressings. Internally they are used, for no scientifically known reason, in the treatment of rheumatism, small pox, measles, and syphilis.

The cucumber trees, *Kigelia*, and the cayo apples, *Parinari*, resemble the figs in that the edible fruit is used as a cathartic and the tannin-rich bark and root as astringents.

Kino, large quantities of which are exported, is the dried sap of *Pterocarpus erinaceus*, and the similar sap of at least seven other species is also used as an astringent, topically and internally.

The root and bark of the jujubes, *Zizyphus*, are very rich in tannin and are widely used as astringents and in the treatment of scrofula. The edible fruit is acid and astringent. The bark of *Z. jujuba* is employed as a fish poison in Abyssinia.

**SAPONINS.** Three genera of leguminous trees, the action of which is probably dependent on saponins, are found over much of Africa, namely, *Milletia*, the sea bean or sword bean, *Entada*, and *Albizzia*. As with most plants containing saponins, the indications for their use are not well defined, and they are employed for many unrelated conditions including epilepsy, cystitis, pneumonia, syphilis, leprosy, gonorrhoea, and as vermifuges. The bark and other parts of musenna, *Albizzia anthelmintica*, and other species of this genus contain a sapotoxin, musennin, which gives them value especially as taeniocides. They are used also for destruction of skin parasites. Like the related genus of *Pterocarpus*, the species of *Entada* and *Albizzia* also contain tannin, and the bark is used as an astringent in diarrhoea and dysentery, and internally to check uterine bleeding and the discharge in gonorrhoea, as well as topically in ophthalmia and as a wound dressing.

**ALKALOIDS.** Many of the Amaryllidaceae show the presence of toxic alkaloids in the bulbs. Two of these, buphanine and haemanthine, are narcotic in action, the other, lycorine, a cerebral convulsant. One or more of these lend toxicity to the bulbs of the species of blood flower, *Haemanthus*, and the closely related candelabra flower, *Buphane*, which are employed as arrow poisons in West and South Africa and as topical applications to ulcers, wounds, and the sores of leprosy. Some species of blood flower are said to check febrile colds. Several species of *Hypoxis* which contain haemanthine are used as expectorants and vermifuges and to destroy vermin. The bulbs of six species of the Natal lily, *Crinum*, containing lycorine, are used in colds, scrofula, and leprosy, as are those of *Clivia* and *Cyrtanthus*, which yield the same alkaloid.

Many of the Solanaceae contain alkaloids like those of belladonna, which relieve cramps of smooth muscle and in large dose are delirifacient, like hyoscamine, or narcotic, like hyoscine. Death may result from respiratory paralysis. The nightshades,

*Solanum*, all parts of which contain the delirifacient alkaloid solanine, are used in colic and dysmenorrhea, as cholagogues and diuretics and as applications to painful sores. The thorn apples, *Datura*, containing both hyoscyamine and hyoscyne, are used similarly and the dried leaves are smoked for asthma. The leaves of several species are exported from North Africa. The native henbane, *Hyoscyamus albus*, contains the same alkaloids and is used both externally and internally to relieve pain. The Tuaregs of central Sahara are said to commit homicide by administration of *H. falezlez*.

The Rubiaceae are also rich in important alkaloids, the best known being quinine, which comes from several species of *Cinchona*, all natives of tropical America. A number of these, chiefly *C. calisaya*, are now cultivated in Congo and Angola, and the bark is both exported and used as an antiperiodic. Less important is yohimbene, the alkaloid from the bark of *Corynanthe*, which is used as an antiperiodic, febrifuge, bitter tonic, and astringent in western Africa from Guinea to Angola. The bark of *C. johimbi* is exported from West Africa. Similar alkaloids are found in *Crossopteryx*, several species of which occur in both East and West Africa. The bark is valued as a febrifuge, antiperiodic, and astringent.

Several species of *Lantana*, known as birds' brandy or wild sage, one of which, *L. brasiliensis*, was introduced by the Portuguese and now grows wild, contain lantanine, which is similar in action to quinine and like it useful in fevers and colds and as a general tonic. The quinine tree of South Africa and other species of *Rauwolfia* contain three alkaloids—rauwolfine, ajmaline, and serpentine—and the bark and root are used as tonics, febrifuges, and cathartics. The leaves of *R. vomitoria* are emetic, and an extract of the bark is used to destroy vermin.

More toxic alkaloids are found in the numerous species of *Senecio*, some forty of which are listed as poisonous to grazing cattle. The only named alkaloid appears to be senecofoline, extracted from *S. latifolius*. This principle causes cerebral convulsions followed by coma, and also internal hemorrhages. The leaves of several species are used in the Congo, East and South Africa, and Madagascar, as diuretics in dropsy, as expectorants, and to relieve the pain of toothache, colic, and rheumatism.

A toxic alkaloid, monocrotaline, is present in many species of rattle bush, *Crotalaria*, which are also dangerous to cattle and are used as arrow poisons. Internally the root and leaves of half

a dozen species are employed for intestinal and uterine cramps and in malaria and other fevers.

The bark and root of several species known as false pareira, *Cissampelos*, yield three alkaloids—cissampeline, pelosine, and sepeerine. Extracts are used throughout tropical Africa as diuretics, emmenagogues, and febrifuges, and in the treatment of venereal disease. The root of *C. torulosa*, which has a milky juice and a bitter taste, is chewed to relieve toothache by the Kaffirs and Zulus. True pareira, once much used in the United States as a bitter, is obtained from a related species, *Chondrodendron tomentosum*.

**ESSENTIAL OILS.** These oils are universally present in all parts of plants belonging to the Labiatae, many of which are of commercial importance. Lavender (*Lavandula*), hoarhound (*Marrubium*), marjoram (*Origanum*), rosemary (*Rosmarinus*), sage (*Salvia*), and thyme (*Thymus*) are gathered in large quantity in North Africa for export and for use, chiefly by the Arabs and whites, as condiments, as diuretics, and for colds. Various native species of basil (*Ocimum*), mint (*Mentha*), germander (*Teucrium*), hedge-nettle (*Stachys*), bugle-weed (*Ajuga*), and cat-herb (*Ballota*), other species of which are used medicinally in Europe and America, are employed similarly and for intestinal and uterine colic, as febrifuges and antiperiodics, and as antiseptic wound dressings. Other genera of Labiates more restricted to the tropics but used for the same general purposes include *Hyptis*, *Leucas*, *Lasiocorys*, *Moschosma*, *Plectranthus*, *Solenostemon*, and *Tetradenia*.

Of equal importance are the essential oils of the Myrtaceae, which include *Eugenia*, the genus which provides cloves and Guinea cloves, used as condiments and carminatives. Cloves are the most important crop of Madagascar and the neighboring coast, three thousand to five thousand tons being exported yearly. The bark of the clove tree is used in treating syphilis and rheumatism, and that of a closely related genus, *Acmena*, is considered by the Zulus as of value in chronic lung disease. Not used in native medicine, but valued by white physicians and for export, is *Eucalyptus* from Australia, one species of which is cultivated in many parts of Africa.

In the Zingiberaceae the oils are usually associated with pungent resins, and the combination gives them added value as flavors and condiments and in the treatment of colic and as vermifuges. The most important is ginger (*Zingiber*), the roots of which are used by the Natives and exported by the ton

from West Africa. Cardamom and melagueta pepper are the fruits of several species of *Amomum* and of the closely related *Elettaria*. True cardamom, the seed of *E. repens* (*A. cardamomum*), Madagascar cardamom from *A. angustifolium*, and grains of paradise or melagueta pepper from *A. melagueta* are all important exports. The seed as well as the roots of these and related species are used as condiments, carminatives, vermifuges, and counterirritants in West Africa and Madagascar. The roots of other plants of the same order, including galanga (*Alpinia*), turmeric (*Curcuma*), Madagascar ginger (*Hedychium*), and *Phrynium*, are used for the same purposes as ginger and are minor exports.

**RESINS.** Resins are commonly associated with other principles which modify their action. In Africa, myrrh and *African bdellium*, which are exudates from the bark of species of *Commiphora*, occur mixed with a gum like gum arabic. These gum-resins are used as wound dressings and plaster bases, and in dysentery, and are also exported. In *Combretum* and *Terminalia* the resin in the leaves and roots is associated with tannin. Extracts are widely used as purgatives, cholagogues, antidyserterics, vermifuges, and for wound dressings. In some species of *Terminalia* the astringency is greater than the laxative action of the resin.

In the Cucurbitaceae the resin is often associated or combined with a glucosidal or simple toxic principle such as the cucumin and myriocarpin of *Cucumis*, the colocynthin of *Citrullus*, the momordicin of *Momordica*, and the toxic protein of *Pepo*. All these drugs are used as purgatives and vermifuges, and several are extremely toxic, myriocarpin inducing edema of the lungs and others violent vomiting and purging.

The purgative roots of the Convolvulaceae depend for their action on the presence of an irritating resin and a purgative glucoside such as ipomein or convolvulin.

The many species of lions' ears, or dagga (*Leonotis*), contain a bitter purgative resin in all parts of the plant. Extracts of the leaves or roots are employed as purgatives, taeniocides, and as dressings for veldt sores, syphilitic ulcers, hemorrhoids, etc. They are used both internally and topically in snake bite.

**ANTHRAQUINONE CATHARTICS.** These cathartic principles are probably used more extensively than any others, and the two great African genera containing them—*Aloe* and *Cassia*—include the most important drug plants of the continent. The leaves

of more than twenty species of *Cassia*, all containing emodin, known as senna, are collected for use, and many of them are exported. Of the chief species, *C. acutifolia*, over one thousand tons are exported annually as *Alexandrian senna* from the Anglo-Egyptian Sudan and Egypt. Leaves of Senegal cassia (*C. obovata*) are sometimes exported. The pods of many species also contain emodin, and those of purging cassia (*C. fistula*) are exported in large amount from the same regions. Cassia leaves, usually in powder or as a paste, are also used to dress wounds. The bark and root of many species contain tannin and serve as astringents. A toxalbumin in the seeds of *C. abusus* gives them value as a vermifuge and as applications to old ophthalmias.

Aloes is the dried juice exuding from the cut leaves of any one of over twenty species of *Aloe*. The chief commercial varieties are: socotrine aloes exported chiefly from Arabia and derived in large part from *A. perryi* and *A. succotrina*; and Cape aloes, from *A. ferox*, *A. africana*, and *A. plicatilis*, exported from South Africa. Although only these species are recognized officially as sources of true aloes, it is probable that the drug arriving in the market is a mixture from many species not distinguished by the Native collectors. The dried latex seems to be less valued by the Natives than by the whites as a cathartic, but extracts of the leaves and roots of various species are applied to burns and sores and to sore eyes, and are used as vermifuges and antisiphilitics. Among these are *A. arborescens*, *A. latifolia*, *A. mitriformis*, *A. platylepis*, *A. purpurascens*, *A. saponaria*, *A. spicata* of South Africa; *A. abyssinica*, *A. bainesii*, *A. constricta*, *A. cryptopoda* of East Africa; *A. macroclada*, *A. oligophylla*, *A. sahundra*, and *A. vera* from Madagascar.

**MISCELLANEOUS PRINCIPLES.** One of the most important of the principles which do not fall in any of the large groups is anemonol, an oily acrid liquid, changing on exposure to an equally irritant crystalline compound, anemonin. Anemonol is present in many of the Ranunculaceae such as the wind-flowers (*Anemone*), and the closely related *Knowltonia*, as well as in virgins-bower (*Clematis*) and buttercups (*Ranunculus*). The roots and leaves of these plants, either fresh, dried, powdered, or as extracts, serve as counterirritants and epispastics, as snuff to clear the head in colds and headache and internally as purgatives and even as homicidal poisons.

Associated with irritant resins are several simple principles. One of the most important of these is piperine, the pungent

principle of various species of *Piper*, including Guinea pepper, Ashanti pepper, and black pepper. Similar in character is anonacein, from *Xylopia*, also called Guinea pepper. The fruit and more rarely the leaves of these plants are used as counter-irritants in rheumatism, headache, and toothache, and as carminatives, expectorants, and vermifuges. Also associated with a resin and perhaps combined with it is euphorbon, found in the latex of many species of *Euphorbia*. The latex, or parts containing it, is used as purgative, expectorant, emetic, and vermifuge, and as an application to ringworm and other skin lesions. The latex of many species is a constituent of arrow poisons, less often used as fish poison and rarely as a homicidal poison. Similarly combined with resins are rottlerin, the principle of *Mallotus*, and kosotoxin, found in *Brayera* and perhaps in *Celosia*. They are used chiefly as taeniocides. Many authorities believe both of these, as well as euphorbon, to be resinous bodies. Doubt also exists as to the nature of musennin, the principle of *Albizzia*, which may be a sapotoxin or a simple substance. Extracts of the root and bark containing it are used as taeniocides, arrow poisons, and for destroying animal parasites.

The only principles known to exist in the species of *Indigofera* and *Oldenlandia* used as remedies by the Natives, are anthraquinone dyes such as indican, alizarin, and purpurin. These are said to be physiologically inactive and may not be responsible for the reputed value of the plants as emetics, sedatives, vermifuges, and astringents. The root of *I. zeyheri* is said to be a paralytic poison.

**PRINCIPLES OF DOUBTFUL NATURE.** In several important genera there is difference of opinion as to the nature of the principle, or one type is reported from one species and another from other members of the genus. The following seem worthy of discussion:

*Artemisia.* Most of the *Artemisias* contain only nontoxic essential oils, as do *A. afra* and *A. herba-alba*, which are used as expectorants. Some species, including *A. absinthium*, which is cultivated in North Africa, have a narcotic oil associated with a bitter principle, absinthin, and are valued as intoxicants; while *A. judaica* and *A. ramosa*, like the Russian species, *A. maritima*, yield santonin, a neutral principle valuable against roundworms.

*Cluytia.* Of these Euphorbiaceous shrubs some, including *C. abyssinica*, are said to yield a glucoside, cluytiarol; others, such

as *C. hirsuta*, an alkaloid used like quinine as a tonic and febrifuge. Still others may contain a sapotoxin.

*Gomphocarpus*. According to some authors the action of plants of this genus as tonics and purgatives is due to the presence of uzarin, a cardiac glucoside. Other authors have reported a neutral principle, cynanchotoxin, which causes clonic convulsions in overdose. The former is probably correct.

*Erythrina*. Some species, such as *E. indica*, contain a narcotic alkaloid, erythrine, and two paralytic alkaloids, erythroidine and coralloidine. Others, including *E. senegalensis*, owe their action to a bitter principle, picrerythrin. It is possible that all species show more than one of these. Extracts are used as febrifuges, expectorants, anti-asthmatics, and wound dressings.

*Jatropha*. Like most Euphorbiaceae, the species are all poisonous, but the toxic principle may be a toxalbumin, curcin, as in *J. curcas*, which is purgative and vermifuge, or a convulsant, hyenanchine, which may be an alkaloid or a neutral principle as in *J. globosa*, which is employed to poison hyenas. Other species are used as purges, emetics, and wound dressings.

*Mussaenda*. Different species are said to depend for their action respectively on a tannin, a sapotoxin, or a bitter glucoside.

*Vernonia*. This is a large and varied genus, which should perhaps be divided into several genera. Only three species seem to have been analyzed. One of these, *V. nigritiana*, contains a cardiac glucoside, vernonin; a second, *V. hildebrandtii*, a toxic alkaloid; and the third, *V. senegalensis*, an alkaloid resembling emetine in action. All of the species irrespective of their composition are used as emetics and expectorants, as tonics and febrifuges, and for colicky pain.

*Tephrosia*. The many species of this genus which are utilized as arrow poisons, fish poisons, and for the destruction of vermin contain a toxic principle, tephrosin, which some chemists claim is a sapotoxin, and others identify with rotenone, which is not a glucoside.

*Xanthoxylum*. The bark of all the species contains tannin, but other principles vary. The root of fever tree, *X. capense*, is said to yield a resin and bitter, and the seed an alkaloidal pungent principle like piperine. The leaves of *X. macrophyllum* show an essential oil with menthol as a constituent, while artar root from *X. senegalense* yields a bitter alkaloid, berberine, a toxic glucoside, xanthotoxin, and a resin similar to cubebin. Extracts of the roots of various species are used as bitter tonics, expectorants and astringents, and the seeds as carminatives.



*Lasiosiphon*. Several species are toxic to cattle and are used as arrow poisons. The tannin and essential oil reported from one species do not explain the toxicity, but it may depend on a toxic resin similar to that in the European drug plant *Mezereum*, to which the genus is closely related.

*Desmodium*. The presence of tannin, the only chemical finding, does not explain the reported efficacy of several species as expectorants, febrifuges, and antispasmodics.

Other genera in which the use of several species in different parts of Africa suggests the presence of an active principle, but in regard to which no chemical studies are available, include *Bulbine*, *Cussonia*, *Gladiolus*, *Mahernia*, *Oncoba*, *Polygala*, *Sanseveria*, and *Vangueria*.

It is evident from the preceding discussion and from the tables which follow that Africa presents for the pharmacologist and drug chemist a wide field which has been very inadequately cultivated. Very few of the Native drug plants have been introduced into Western medicine, and many are probably worthy of extended use. At present, however, the therapeutic tendency is toward synthetic chemical substances the supply of which is not subject to the vicissitudes of commerce or weather, and it does not seem likely that the drug plants of Africa will have any increased commercial importance in the near future.

## NOTE ON EXPORT OF PLANT DRUGS FROM AFRICA

The export of plant drugs from Africa has been an important industry for many centuries, but the total volume of exports is so small compared to that of plant foods and animal products that it is neglected in the annual official reports. These commonly lump together "drug, dye and tannin plants," and give only a total sum which is, of course, of no value in this study. It is possible to obtain a fairly complete list of plants exported for medicinal use, although quantitative data are not often found. Most of those which are exported in sufficient quantity to warrant mention in official reports are drugs like cloves, the medicinal use of which is of secondary commercial importance. Occasionally an author will mention the quantity of a given drug exported from a certain colony in a given year, and such figures are included in the following table, which lists the plants exported and the colony of origin. The world wars have largely disrupted the normal flow of trade, and figures have in most cases not been published in the last few years.

The only complete and recent figures are those of the United States Department of Commerce for drugs imported directly into this country from Africa. These figures are given in Table 2 and, in considering them, two facts must be borne in mind. First, that part of the crop may have been sent to England or France and thence to this country, in which case one of these would appear as the place of origin rather than Africa, so that the figure given may not even represent the total import from the colony. Second, shipments are listed according to the port from which the ship sailed, and part of the shipment may have been derived from a colony other than that shown in the table.

Figures for only two drugs, gum arabic and senna, are given in a similar British publication for 1939.

# PLANT DRUGS EXPORTED

TABLE 1

## PLANT DRUGS EXPORTED FROM AFRICA

### Flavors, Spices and Condiments

Madagascar cardamom	<i>Annonum angustifolium</i>	Madagascar
Melagueta pepper	" <i>melagueta</i>	West Africa
Dill	<i>Anethum graveolens</i>	North "
Cinnamon	<i>Cinnamomum zeylanicum</i>	" "
Coriander	<i>Coriandrum sativum</i>	" " Morocco, 1911, 1,600 tons
Cumin	<i>Cuminum cyminum</i>	" " " , 1911, 1,300 "
Cardamom	<i>Elettaria repens</i>	" "
Cloves	<i>Eugenia caryophyllata</i>	West Tropical Zanzibar, 1898, 2 "
Guinea cloves	" <i>owariensis</i>	Tropical Africa
Orris root	<i>Iris florentina</i>	North "
Lavender	<i>Lavandula vera</i>	" "
Hoarhound	<i>Marrubium vulgare</i>	" "
Nutmeg	<i>Myristica fragrans</i>	Madagascar, Mozambique
Marjoram	<i>Origanum majorana</i>	North Africa Tunisia, 1922, 2 tons
Allspice	<i>Pimenta officinalis</i>	" " " , 1922, 1 "
Anise	<i>Pimpinella anisum</i>	" "
Ashanti pepper	<i>Piper chusii</i>	" "
Guinea pepper	" <i>guineense</i>	East "
Bitter almond	<i>Prunus amygdala-amara</i>	West "
Rosemary	<i>Rosmarinus officinalis</i>	North "



TABLE 1—Continued

Buchu	<i>Barosma</i> sp.	South Africa	Cape Col., 1924, 76 tons
Borage	✓ <i>Borago officinalis</i>	North Africa	Algeria, 1922, 20 tons
Koussou	<i>Brayera anthelminthica</i>	North Africa	
Senna	✓ <i>Cassia acutifolia</i> et al.	North & West	A. E. Sudan, 1924, 1,000 tons
Purging cassia	✓ " <i>fstula</i>	North-East Afr.	
Colocynth	✓ <i>Citrullus colocynthis</i>	General	A. E. Sudan, 1924, 16 tons
Meadow saffron	<i>Colchicum autumnale</i>	North Africa	
Johimbene	<i>Corynanthe johimbi</i>	Congo, Angola	Cameroon, 1910, 8 tons
Mezereum	<i>Daphne gnidium</i>	North Africa	Algeria, 1922, 4 tons
Thorn apple	✓ <i>Datura stramonium</i>	General	Algeria, 1922, 3 tons
Derris	<i>Derris uliginosa</i>	East Africa	
Sassy bark	<i>Erythrophileum guineense</i>	Tropical Africa	
African mallow	<i>Hibiscus sabdariffa</i>	General	Algeria, 1922, 30 tons
Henbane	† <i>Hyoscyamus albus</i>	North Africa	
Calumba	<i>Jateorhiza columba</i>	East Africa	
Kamala	✓ <i>Mallotus philippensis</i>	Abyssinia	
Cowhage	✓ <i>Mucuna pruriens</i>	Tropical Africa	
Opium	<i>Papaver somniferum</i>	North Africa	
Wall pellitory	<i>Parietaria officinalis</i>	"	
Calabar bean	✓ <i>Physostigma venenosum</i>	West Africa	Sierra L., 1915, 29 tons
Pomegranate bark	✓ <i>Punica granatum</i>	General	Algeria, 1922, 10 tons
Bitterwood	✓ <i>Quassia africana</i>	Congo	
Strophanthus	✓ <i>Strophanthus</i> sp.	West Africa	
"	" <i>kombe</i>	Tropical Afr.	Nyasaland, 1937, 2 tons
Icaja bark	✓ <i>Strychnos icaja</i>	Senegal, Congo	
Tamarind	✓ <i>Tamarindus indicus</i>	General	
Fenugreek	<i>Trigonella fenugracum</i>	North Africa	Morocco, 1911, 11,000 tons
Squill	<i>Urginea scilla</i>	"	Algeria, 1922, 30 tons

TABLE 2  
IMPORTS INTO THE UNITED STATES FROM AFRICA

		1929	1936	1940
Aloes	South Africa	62,607 lbs.	43,763 lbs.	113,342 lbs.
Buchu	“ “		124,121 “	108,526 “
“	British West Afr.	2,820 “		
Castor oil beans	Mozambique			226,964 “
Cinnamon	British East Afr.		11,659 “	
Clove oil	Madagascar		38,210 “	
Derris	British East Afr.			8,664 “
Fenugreek	Morocco			912,170 “
Gum arabic	Egypt	3,000 tons	4,000 tons	6,300 tons
“ “	Morocco	8,612 lbs.		
“ “	Nigeria			19,218 lbs.
“ “	French West Afr.			142,036 “
“ “	British East Afr.			1,970 “
Henbane	Egypt			64,955 “
Henna	“		289,077 lbs.	
Hoarhound	Algeria, Tunisia	25,986 “		
Licorice	Egypt	324 tons		
Myrrh	British East Afr.			44,128 “
Origanum oil	Morocco			3,845 “
Orris root	“			7,000 “
Patchouli	British East Afr.		28,648 “	
Pyrethrum	“ “ “		764 tons	472 tons
Rosemary oil	Morocco			24,119 lbs.
Sandalwood	British East Afr.		4,480 lbs.	
Senna	Egypt	500 tons	200 tons	260 tons
Sesame	“		8 “	
Stramonium	Algeria, Tunisia	4,844 lbs.		

TABLE 3  
IMPORTS INTO ENGLAND FROM AFRICA

		1939
Gum arabic	Egypt	7,400 tons
Senna	“	767 “
“	A.E. Sudan	230 “

## GENERIC SYNONYMS

In view of the fact that in certain genera there is considerable difference in the application of scientific names, the following list showing such differences in usage is given. In each column the first name is that used by other authors, the second is that given in the *Index Kewensis*. In some closely related genera such as *Adenia*, *Modecca*, and *Ophiocaulon*; and *Asclepias*, *Calotropis*, *Gomphocarpus* and *Xymalobium*; species have been transferred from one to another by different authors until the nomenclature is extremely confused.

SYNONYM	INDEX KEWENSIS	SYNONYM	INDEX KEWENSIS
Abelmoschus	Hibiscus	Bunburia	Cynanchum
Adenia	Modecca	Buphane	Haemanthus
"	Ophiocaulon	Byrsocarpus	Rourea
Adenopus	Physedra	Calla	Zantedeschia
Aframomum	Aromum	Caloncoba	Oncoba
Agelaea	Cnestis	Canthium	Plectronia
Albizzia	Picrocarpus	Cardiogyne	Plecosperrimum
Alpinia	Elektaria	Carpobrotus	Mesembryanthemum
Amaryllus	Buphane	Ceiba	Eriodendron
Ammania	Nesaea	Celastrus	Gymnosporia
Amonum	Elektaria	Celtis	Trema
"	Curcuma	Cephalanthus	Mitragyna
"	Zingiber	Cerardia	Othonna
Anemone	Knowltonia	Chaetacanthus	Calophanes
Anthonotha	Macrobobium	Challetia	Dichapetalum
Aphania	Sapindus	Cissus	Vitis
Asclepias	Gomphocarpus	Cocculus	Tinospora
"	Xymalobium	Coelocline	Xylophia
"	Commiphora	Combretodendron	Petersia
Balsamodendron	Eriodendron	Conocarpus	Anogoncus
Bombax	Graderia	Conpharyngea	Plumeria
Popusia	Spermacocce	Convolvulus	Ipomea
Borreria	Kedrostis	Costus	Arnorum
Bryonia		Croton	Mallotus

(List of synonyms, *continued*)

SYNONYM	INDEX KEWENSES	SYNONYM	INDEX KEWENSES
Cubeba	Piper	Imantophyllum	Clivia
Cucumis	Citrullus	Jatropha	Ricinodendron
Cynbopogon	Andropogon	Kickxia	Funtumia
Deinbollia	Sapindus	Knowltonia	Ancmonc
Delonix	Poinciana	Lansea	Odina
Desmanthus	Dichrostachys	Lasiophon	Gnidia
Echinocactus	Cereus	Lindackeria	Oncoba
Erythrophleum	Gleditschia	Lindernia	Vandellia
Eugenia	Acmena	Lissochilus	Eulophia
Eulophia	Lissochilus	Lochnera	Vinca
Fagara	Xanthoxylum	Lonchocarpus	Milletia
Garcinia	Cola	Macrobotrya	Baccaurea
Geoffroya	Andira	Majorana	Origanum
Gnidia	Arthrosolen	Meiocarpidium	Uvaria
Gongrothamnus	Vernonia	Methonica	Gloriosa
Guilandina	Caesalpina	Milletia	Lonchocarpus
Haemanthus	Buphanc	Modecca	Adenia
Hagenia	Brayera	"	Ophiocaulon
Hartwegia	Chlorophytum	Moghania	Flemingia
Hedyotis	Oldenlandia	Momordica	Melothria
Heeria	Anaphrenium	Moronobea	Symphonia
Hermannia	Mahernia	Mukia	Melothria
Heudelotia	Commiphora	Myrsine	Rapanea
Hyenanche	Jatropha	Nauclera	Mitragyna



(List of synonyms, *Continued*)

SYNONYM	INDEX KEWENSIS	SYNONYM	INDEX KEWENSIS
Neobaronea	Phylloxylon	Scilla	Urginea
Ophiocaulon	Adenia	Simaruba	Quassia
Osbeckia	Disotis	Spirostachys	Exoecaria
Oxalis	Bryophyllum	Steganotenia	Peucedanum
Pachylasma	Stachothyrus	Sterculia	Cola
Paullinia	Serjania	Stobaea	Berkheya
Pergularia	Dacmia	Strobilanthes	Asystasia
Perianthopodus	Cayaponia	Swietiana	Khaya
Physedra	Adenopus	Syzgium	Eugenia
Pseudocinchona	Corynanthe	Tainum	Portulaca
Ptychotis	Carum	Tanghinia	Cerbera
Pusaetha	Entada	Teclea	Toddalia
Pyrethrum	Anacyclus	Thymelea	Passerina
Rapanea	Myrsine	Toxicodendrum	Jatropha
Rhoicissus	Vitis	Triclisia	Tiliacora
Richardia	Zantedeschia	Tripotaxis	Herderia
Rinorea	Alsodeia	Tylophora	Periploca
Rottlera	Mallotus	Tylostemon	Orcodaphne
Rourea	Byrsocarpus	Uragoga	Psychotria
Roxburghia	Parkia	Uvaria	Hexalobus
Rytigia	Vangueria	Vincetoxicum	Cynanchum
Sapota	Achras	Xanthoxylum	Fagara
Schumannophyton	Tetrastigma	Xylobia	Hexalobus

DEFINITIONS OF MEDICAL TERMS USED IN TABLES 4-15

Alterative	Improving general nutrition
Anodyne	Relieving pain
Anthelmintic	Expelling intestinal worms
Antiparasitic	Destroying mites and lice, etc.
Antiperiodic	Curing malaria
Antispasmodic	Relieving motor restlessness
Aphrodisiac	Sexual stimulant
Astringent	Precipitating proteins, constricting bloodvessels
Carminative	Relieving colicky pain
Cathartic	Causing bowel movement
Cholagogue	Increasing flow of bile
Condiment	Aiding digestion. Flavor
Counterirritant	Applied locally for pain
Demulcent	Topically soothing
Diuretic	Increasing flow of urine
Emetic	Causing vomiting
Emmenagogue	Regulating menses
Emollient	Topically soothing
Expectorant	Softening respiratory mucus
Febrifuge	Reducing fever
Galactagogue	Increasing flow of milk
Insecticide	Destroying noxious insects
Intoxicant	Causing mental exhilaration
Laxative	Mildly cathartic
Narcotic	Causing mental stupor
Purgative	Strongly cathartic
Rubefacient	Topically irritating
Sedative	Quieting nervousness
Sternutatory	Causing sneezing
Stomachic	Stimulating stomach
Sudorific	Causing sweating
Tonic	Improving general nutrition
Vermifuge	Expelling intestinal worms
Vesicant	Raising blisters

# CHEMICAL BASIS OF DRUG ACTION

TABLE 4  
USES OF DRUG PLANTS CONTAINING TANNINS

General Astringent	Wound Dressing	Diarrhea	Vermifuge	Ophthalmia	Gonorrhea
Alnus	Acacia	Acacia	Acacia	Acacia	Acacia
✓Anogicisus	Alchornea	Albizzia	Anaphrenium	Albizzia	Alchornea
✓Albizzia	✓Albizzia	Anaphrenium	Agrimonia	Alchornea	Chlorophora
✓Anacardium	✓Calophyllum	Anona	Alchornea	Anaphrenium	Cyathula
✓Anona	✓Cassia	Antholyza	✓Anogicisus	✓Bauhinia	Elephantorhiza
✓Artocarpus	✓Chenopodium	Brucea	✓Bauhinia	✓Calophyllum	✓Eriodendron
✓Bauhinia	✓Clerodendron	Canarium	Brachylena	✓Cassia abusus	✓Erythrina
✓Butea	✓Combretum	Carapa	✓Bridelia	✓Ceclosia	Gunnera
Cajanus	Connarus	✓Cassia	✓Clerodendron	Dichrostachys	Haronga
Chrysobalanus	Cyathula	✓Celotia	✓Combretum	Lasioiphon	✓Leea
Crassula	✓Dalbergia	✓Crassula	Connarus	Mikania	Mikania
Diospyros	✓Desmodium	Cyathula	Diospyros	Pentaclethra	Pentaclethra
✓Entada	Diospyros	✓Diospyros	Ekebergia	✓Phyllanthus	✓Phyllanthus
Fluggea	✓Entada	✓Elaeodendron	Geranium	Priva	Randia
✓Garcinia	✓Erythrina	Elephantorhiza	Haronga	Scabiosa	Serjania
Hydnora	✓Ficus	Eriodendron	✓Lawsonia	✓Triumfetta	Spathodea
Hymenaea	Gardenia	Erodium	Spondias	✓Vitis	✓Terminalia
✓Mangifera	✓Grewia	Fluggea	Trema	Ximenea	✓Tribulus
✓Morinda	Guarea	✓Gymnosporia	✓Sterculia		Trichilia
✓Musacnda	✓Gymnosporia	Hydnora			Triclisia
Newbouldia	✓Jatropha	Hymenaea			Ximenea
Parinarium	✓Kigelia	✓Macaranga			✓Zizyphus
✓Pterocarpus	Lasioiphon	✓Mallotus			
✓Quercus gallac	✓Lawsonia	Monsonia			
✓Rhizophora	✓Mallotus	✓Morinda			
✓Rubus	Melianthus	Newbouldia			

TABLE 4—Continued

General Astringent	Wound Dressing	Diarthra	Vermifuge	Ophthalmia	Gonorrhoea
Sapindus	Milkania	Ochina			
Vinca	Morinda	Pelargonium			
Vitis	Ochna	Peltophorum			
Weinmannia	Parinarium	Poterium			
Ximenea	Pelargonium	Pterocarpus			
Xanthoxylum	Peltophorum	Punica			
Zizyphus	Pentaclethra	Quercus gallia			
	Phyllanthus	Rhynchosia			
	Pistacia	Rubus			
	Polygonum	Samadera			
	Poterium	Sapindus			
	Priva	Sarcocolla			
	Rhynchosia	Scabiosa			
	Samadera	Schotia			
	Sarcocephalus	Sclerocarya			
	Semecarpus	Tamarindus			
	Serjania	Terminalia			
	Sesamum	Trema			
	Spathodea	Tribulus			
	Spondias	Triumfetta			
	Tamarindus	Withania			
	Terminalia	Zizyphus			
	Thunbergia				
	Vitis				
	Withania				
	Ximenea				
	Zizyphus				

TABLE 5

## USES OF DRUG PLANTS CONTAINING SAPONINS

<i>Emetic</i>	<i>Expectorant</i>	<i>Febrifuge</i>	<i>Vermifuge</i>	<i>Fish Poison</i>	<i>Insect Poison</i>
✓Albizzia	✓Albizzia	Entada	✓Albizzia	Balanites	✓Albizzia
✓Balanites	✓Balanites	Phytolacca	✓Balanites	✓Barringtonia	✓Cardiospermum
✓Cardiospermum	✓Cardiospermum	✓Tephrosia	Barringtonia	Cynanchum	Milletia
Gouania	✓Dodonaea	Tetrapleura	Gomphocarpus	Morelia	✓Tephrosia
Maesia	Herniaria		Maesa	Mundulea	
Randia	Hippobromus		Mezoneurum	Randia	
Sideroxylon	Phytolacca		Newbouldia	✓Tephrosia	
Tetrapleura	✓Sapindus		Phytolacca	Tetrapleura	
	✓Tephrosia				
	Tetrapleura				

TABLE 6

## USES OF DRUG PLANTS CONTAINING CARDIAC GLUCOSIDES

<i>Arrow Poison</i>	<i>Ordeal and Homicidal</i>	<i>Snake Bite</i>	<i>Vermifuge</i>	<i>Heart Tonic</i>	<i>Expectorant and Emetic</i>
Acokanthera (6 species)	Acokanthera	✓Acokanthera	Acokanthera	Adenium	Acokanthera
Adenium (7 species)	Adenium	✓Adenium	Erythrophileum	✓Cerbera	Carissa
Antiaris	Cerbera	✓Gomphocarpus	Gleditschia	✓Carissa	Gomphocarpus
Cerbera	Erythrophileum	✓Xysmalobium	Gomphocarpus	Erythrophileum	✓Strophanthus
Erythrophileum	Gleditschia			Gomphocarpus	✓Vernonia
✓Nerium	Menabea			✓Strophanthus	Xysmalobium
Periploca	✓Strophanthus			✓Thevetia	
✓Strophanthus (11 species)				Xysmalobium	

TABLE 7  
USES OF DRUG PLANTS CONTAINING BITTER PRINCIPLES

Type of Bitter	Tonic	Against Infection	Colic and Indigestion	Diarrhea Dysentery	Cathartic
Simple	Bryophyllum	Conyza	Agrimonia	Adansonia	Alchornea
Amaroids	Calendula	✓ Dodonaea	Gerbera	✓ Alchornea	✓ Kigelia
	Clerodendron	Gymnosporia	Quassia	✓ Gymnosporia	
	Conyza	Khaya	Scoparia	Jateorhiza	
	Jateorhiza	Leucadendron	Simaba	Simaba	
	Khaya	Nesaea		Spathodea	
	Quassia	Quassia			
	Stenocline				
Resinous Bitters	Boswellia	Brucea	Brucea	Brucea	✓ Caesalpina
	Brucea	Caesalpina	Caesalpina	Canarium	Carapa
	Carapa	Carapa	Canarium	Quassia	
	Lawsonia	Trema	✓ Momordica	✓ Trema	
	✓ Momordica	Xanthoxylum	Sarcocephalus		
	Sarcocephalus		Xanthoxylum		
	Swertia				
	✓ Trema				
	Xanthoxylum				
Glucosidal Bitters	✓ Carissa	Danais	✓ Acorus	✓ Gymnosporia	✓ Clerodendron
	Chironia	✓ Gymnosporia	✓ Gymnosporia	Matricaria	Chironia
	Clerodendron	✓ Morinda	✓ Mitragna	✓ Morinda	Marrubium
	Cyclopia	✓ Mussaenda	✓ Morinda	Electronia	✓ Morinda
	Danais	Pitosporum	Electronia		Xylophia
	✓ Gymnosporia	Toddalia	Xylophia		
	✓ Mussaenda		✓ Zizyphus		
	Toddalia				

TABLE 7—Continued

Type of Bitter	Vermifuge	Expectorant	Urinary Infection	Counter-irritant	Wound Dressing
Simple	Agrimonia	Alchornea	Alchornea	Alchornea	Alchornea
Amaroids	Alchornea	Calendula	Calophyllum	Calophyllum	Calendula
	Brachylena	Clerodendron	Scoparia	Dodonaea	Calophyllum
	Clerodendron	Dodonaea	Spathodea	Melia	Conyza
	Melia			Plumbago	Gymnosporia
	Quassia			Scoparia	Jateorhiza
	Spathodea				Kigelia
					Spathodea
					Xylopia
Resinous Bitters	Canarium	Trema	Barosma	Caesalpina	Canarium
	Carapa	Xanthoxylum	Boswellia	Carapa	Carapa
	Lawsonia		Canarium	Sarcocephalus	Lawsonia
	Momordica		Mikania		Momordica
	Trema		Momordica		Sarcocephalus
	Xanthoxylum				
Glucosidal Bitters	Clerodendron	Carissa	Barosma	Carissa	Clerodendron
	Xylopia	Celastrus	Carissa	Clerodendron	Danais
		Clerodendron	Diosma	Xylopia	Gymnosporia
		Cyclopia	Mitragyna		Morinda
		Diosma	Mussaenda		Toddalia
	Toddalia		Xylopia		
	Xylopia				
	Zizyphus				

TABLE 8  
USES OF DRUG PLANTS CONTAINING ALKALOIDS

<i>Tonic</i>	<i>Bitter</i>	<i>Febrifuge</i>	<i>Antiperiodic</i>	<i>Expectorant</i>	<i>Diuretic</i>
Acalypha	Carapa	Adina	Adansonia	Acalypha	Anagyris
Catha	Cinchona	Alstonia	Caesalpinia	Adansonia	Borhaavia
Cissampelos	Corynanthe	Carapa	Cephalanthus	Anacyclus	Chasmanthera
Cluytia	Crossopteryx	Clivia	Cinchona	Cadaba	Cissampelos
Cola	Holarbena	Corynanthe	Cluytia	Cynoglossum	Cola
Corynanthe	Jateorhiza	Crinum	Corynanthe	Cyrtanthus	Cyrtanthus
Crinum	Khaya	Crossopteryx	Crinum	Hacmanthus	Gloriosa
Erythroxylon	Mimosa	Dodonaea	Crossopteryx	Hypoxis	Hacmanthus
Khaya	Mitragyna	Erythrina	Crotalaria	Lantana	Mitragyna
Mucuna	Moringa	Gaertera	Erythrina	Mesembryanthemum	Moringa
Sarcocephalus	Sarcocephalus	Holarbena	Khaya	Mitragyna	Ocotea
Stachys	Tinospora	Justicia	Mitragyna	Nigella	Senecio
Tabernanthe	Trigonella	Khaya	Picalima	Peganum	Solanum
Tinospora	Toddalia	Lantana	Sarcocephalus	Senecio	Tinospora
Toddalia	Xanthoxylum	Mitragyna	Solanum	Solanum	Tribulus
Vernonia	Xysmalobium	Moringa	Tiliacora	Toddalia	Xysmalobium
Xanthoxylum		Nigella	Toddalia	Trigonella	
Xysmalobium		Peganum		Vernonia	
		Picalima		Withania	
		Rauwolfia			
		Sarcocephalus			
		Senecio			
		Solanum			
		Tinospora			
		Vernonia			
		Xanthoxylum			





TABLE 9  
USES OF DRUG PLANTS CONTAINING ESSENTIAL OILS

<i>Carminative</i>	<i>Anti-Colic</i>	<i>Anti-Catarrh</i>	<i>Emmenagogue</i>	<i>Rubefacient</i>	<i>Febrifuge</i>
Alpinia	Amomum	Acnena	Cinnamosma	Ammi	Ajuga
Alyxia	Andropogon	Amomum	Curcuma	Amomum	Andropogon
Agrimonia	Artemisia	Andropogon	Hyptis	Baphia	Artemisia
Amomum	Ballota	Artemisia	Ocimum	Calophyllum	Clausenia
Ammi	Carum	Ballota	Stenocline	Eryngium	Eupatorium
Anethum	Chenopodium	Chenopodium	Vanilla	Lasiophon	Hyptis
Artemisia	Curminum	Curminum		Ochna	Lantana
Calendula	Indigofera	Dicoma		Pollichia	Nigella
Carum	Ocotea	Eucalyptus		Spilanthes	Ochna
Cinnamomum	Osyris	Helichrysum		Syzgium	Ocimum
Cinnamosma	Ravensara	Hexalobus		Xanthoxylum	Lippia
Cortandrum	Solenostemon	Hyptis			Petiveria
Curcuma	Lippia	Juniperus			Ravensara
Eugenia	Spilanthes	Lantana			Ruta
Eupatorium	Tetradenia	Lasiocorys			Spilanthes
Hyptis	Teucrium	Lasiophon			Toddalia
Lantana		Lippia			Xanthoxylum
Lippia		Monsonia			
Mentha		Moschosma			
Monodora		Nigella			
Myristica		Ochna			
Ocimum		Ocimum			
Osyris		Pelargonium			
Piper		Plectranthus			
Ravensara		Salvia			
Salvia		Teucrium			
Teucrium		Toddalia			
Toddalia		Ursinia			
		Uvaria			
		Xanthoxylum			

TABLE 9—Continued

<i>Diuretic</i>	<i>Wound Dressing</i>	<i>Urinary Antiseptic</i>	<i>Infectious Diseases</i>	<i>Vermifuge</i>	<i>Snuff for Headache</i>
Calophyllum	Amygdalus	Andropogon	Artemisia	Agrimonia	Ajuga
Ericephalus	Calophyllum	Agelaca	Carum	Alyxia	Lantana
Eupatorium	Cinnamosma	Barosma	Eugenia	Amomum	Lasiosiphon
Mentha	Curcuma	Dicoma	Monsonia	Andropogon	Mentha
Ocotea	Dalbergia	Osyris	Ocimum	Chenopodium	Ocimum
Petiveria	Dicoma	Petroselinum	Osyris	Cinnamosma	Thymus
Peucedanum	Eryngium	Rosmarinus	Ravensara	Clausenia	
Rosmarinus	Eucahyptus	Santalum		Curcuma	
Spilanthes	Heichrysum	Schinus		Hyptis	
	Lasiosiphon	Thymus		Piper	
	Monodora	Xanthoxylum			
	Ochna				
	Solenostemon				

TABLE 10  
USES OF DRUG PLANTS CONTAINING RESINS

<i>Vermifuge</i>	<i>Wound Dressing</i>	<i>Anti-Parasitic</i>	<i>Expectorant</i>	<i>Urinary Antiseptic</i>	<i>Ophthalmia</i>
Albizzia	Ageratum	Albizzia	Albizzia	Albizzia	Ageratum
Anomum	Aloc	Aloc	Alepeida	Barosma	Albizzia
Anacardium	Boschia	Carapa	Alpinia	Boswellia	Aloc
Brayera	Carpodinus	Fagara	Anacyclus	Canarium	Copaifera
Callilepis	Combretum	Flemingia	Arthrosolen	Daniella	Mikania
Canarium	Commiphora	Haronga	Barleria	Eriodendron	Sarcocephalus
Carapa	Gardenia	Odina	Cheilanthes	Fagara	Spondias
Cheilanthes	Haronga	Pterocarpus	Cucumis	Haronga	
Combretum	Ipomea	Rhinacanthus	Gardenia	Ipomea	
Croton	Lawsonia	Symphonia	Fagara	Mikania	
Cucurbita	Leonotis	Thapsia	Guarea	Petalium	
Flemingia	Mallotus	Vismia	Ipomea	Phyllanthus	
Haronga	Mikania		Leonotis	Randia	
Kalanchoe	Passiflora		Mallotus	Ricinodendron	
Lawsonia	Odina		Mikania	Tribulus	
Leonotis	Phyllanthus		Mimusops	Xylopia	
Mallotus	Pistacia		Passiflora		
Momordica	Plumeria		Pistacia		
Nephrodium	Sarcocephalus		Spondias		
Othonna	Spondias		Toddalia		
Pentadema	Symphonia		Xylopia		
Spondias					
Symphonia					
Xanthoxylum					
Xylopia					

TABLE 10—Continued

<i>Carminative</i>	<i>Purgative</i>	<i>Anti-Dysenteric</i>	<i>Febrifuge</i>	<i>Counter-irritant</i>	<i>Dental Dressing</i>
✓Albizzia	✓Ageratum	Canarium	✓Ageratum	✓Anacardium	Canarium
✓Alpinia	Bixa	Carapa	✓Alstonia	✓Cassalpinia	✓Convulvulus
Anomum	✓Calotropis	Comniphora	✓Anona	✓Alstonia	Fagara
Chlorocodon	Carapa	Daniella	✓Barleria	✓Gardenia	✓Mallotus
Dracaena	Carthamus	Eriodendron	Bixa	✓Moringa	✓Parkia
Hedychium	✓Combretum	Haronga	✓Combretum	✓Parkia	✓Pistacia
✓Moringa	✓Cucumis	✓Mallotus	✓Dracaena	✓Piper	Xanthoxylum
Odina	Flemingia	✓Mangifera	Guarea	Sarcocephalus	Xylopia
✓Othonna	✓Gardenia	✓Odina	Haronga		
✓Piper	Gnidia	✓Pterocarpus	Ipomea		
Randia	Haronga	✓Terminalia	✓Leonotis		
Xanthoxylum	✓Ipomea		✓Mangifera		
✓Zingiber	Kedrostis		✓Moringa		
	Leonotis		Othonna		
	✓Piper		✓Parkia		
	Symphonia		✓Pterocarpus		
	Thapsia		Sarcocephalus		
	Trichilia		Trichilia		
	Xylopia		Xanthoxylum		

# UTILIZATION OF PLANT DRUGS

## KEY TO ABBREVIATIONS

In order to make the following tables more compact, certain abbreviations have been used, some of which require explanation. The abbreviations are included under the headings, Region, Part, Principle, and are used in the following way:

*Region.* The region of Africa in which the plant is used.

- NA. North Africa. Mediterranean Coast from Morocco to Egypt. Sometimes including the northern part of the desert.
- WA. West Africa. Colonies from Senegal to Cameroon. Sometimes including parts of Congo and northern Angola.
- CA. Central Africa. The center of the continent from Anglo-Egyptian Sudan to Northern Rhodesia.
- EA. Eastern Africa. The east coast colonies from Uganda and Kenya to Mozambique. Sometimes including Ethiopia.
- SA. British South Africa, including South West Africa, Southern Rhodesia and southern Mozambique.
- A. A large part of the continent of Africa.
- Ab. Abyssinia.
- Eg. Egypt.
- M. Madagascar.

*Part.* The part of the plant used in preparing the drug.

The only one needing explanation is "root," which is used in the popular sense of underground part, including such underground stems as bulbs and rhizomes.

- Bk. Bark
- Ex. Exudate. Latex flowing spontaneously from cuts
- Fl. Flower or bud
- Fr. Fruit
- Lf. Leaf
- Lx. Latex obtained by expression
- Pl. Entire plant
- Rt. Root
- Sd. Seed
- Wd. Wood

*Principles.* The type of active principle is indicated by a single letter, as follows.

These are explained in Chapter II.

- |                           |                             |
|---------------------------|-----------------------------|
| A. Alkaloid               | M. Mucilage or Gum          |
| B. Bitter principle       | MR. Gum resin               |
| C. Cardiac glucoside      | O. Sulphur oils             |
| D. Dye stuff              | P. Proteins. Toxalbumins    |
| E. Essential oil          | Q. Cathartic Anthraquinones |
| F. Fixed oil              | R. Resins                   |
| G. Glucoside              | S. Saponins                 |
| H. Hydrocyanic acid       | T. Tannins                  |
| L. Phloroglucin glucoside | X. Unclassified principles  |

TABLE 11

## DRUG PLANTS HAVING OTHER COMMERCIAL USES

Name	Region	Part	Principle	Use
<i>Amomum angustifolium</i> *	M	Sd	E	Cholera
Madagascar cardamom				
<i>Amomum melegueta</i> *	WA	Sd	E, Paradol	Condiment, Vermifuge
Grains of Paradise				
<i>Amomum stipulatum</i> *	WA	Sd	E	Roundworm
False cardamom				
<i>Amygdalus persica</i>	NA	Lf	H E	Wound dressing
Peach				
<i>Anethum graveolens</i> *	NA	Ft	E, Carvon	Roundworm
Dill				
<i>Capsicum annuum</i> *	A	Ft	Capsaicin E	Carminative, Rubefc.
Cayenne pepper				
<i>Capsicum frutescens</i> *	A	Ft	Capsaicin E	Carminative
Green pepper				
<i>Carica papaya</i>	A	Ft, Lf	Ferment Papayin	Roundworm, Digestant, Topical
Papaya				
<i>Carthamus tinctorius</i> *	Egypt	Fl	D, Carthamin R	Cathartic
African saffron				
<i>Cinnamomum zylanicum</i> *	TA	Bk	E, Eugenol	Carminative
Cinnamon				
<i>Cola acuminata</i> *	WA	Sd	A, Caffeine Theobromine	Tonic, Colic
Kola				
<i>Commiphora africana</i> *	TA	Ex	MR E	Febrifuge, Wound dressing
African bdellium				
<i>Commiphora myrrha</i> *	E.A	Ex	MR, Myrrhin E, Eugenol	Mouth wash, Wound dressing
Myrrh				
<i>Coriandrum sativum</i> *	NA	Ft	E, Coriandrol	Carminative
Coriander				

\* Denotes export.

TABLE 11—Continued

Name	Region	Part	Principle	Use
<i>Cucurbita pepo</i> Pumpkin	A	Sd	P R	Roundworm
<i>Cuminum cyminum</i> * Cumin	NA	Ft	E. Cuminal	Colic. Colids
<i>Cucuma longa</i> Turmeric saffron	TA	Rt	D	Tonic
<i>Elefaria repens</i> *	WA	Ft	E. Phellandrine E	Roundworm Condiment
Cardamom	EA	Fl. buds	E. Eugenol	Condiment
<i>Eugenia caryophyllata</i> * Cloves	EA	Fl. buds	E. Eugenol	Condiment
<i>Eugenia ovariensis</i> *	WA	Ft. Bk	E. Eugenol	Condiment. Dysentery
Guinea cloves	NA	Ft	Ferments M	Cathartic. Dressing
<i>Ficus carica</i> *	NA	Ft	Ferments M	Cathartic. Dressing
Fig	A	Sd	F	Emollient
<i>Gossypium herbaceum</i> * Cotton seed	A	Sd	F	Emollient
<i>Hyphaene thebaica</i> *	NA	Ex	MR	Dressing
Doom palm. Egyptian bdellium	NA	Rt	G. Iridin E. Ironc	Flavor
<i>Iris florentina</i> *	NA	Rt	G. Iridin E. Ironc	Flavor
Orris root	NA	Tops	E. Lavandulol	Flavor
<i>Lavandula vera</i> *	NA	Tops	E. Lavandulol	Flavor
Lavender	NA	Tops	E. Spike oil	Flavor
<i>Lavandula spica</i> *	NA	Tops	E. Spike oil	Flavor
Spike	NA	Tops	E. Spike oil	Flavor
<i>Lawsonia alba</i> *	TA	Lf	D B	Roundworm. Jaundice
Henna	TA	Lf	D B	Roundworm. Jaundice
<i>Mangifera indica</i> Mango	TA	Bk Lf	T R	Astringent Skin lesions



TABLE 11—Continued

Name	Region	Part	Principle	Use
<i>Marrubium vulgare</i> *	NA	Lf. Tops	B. Marrubiin	Flavor
Hoarhound				
<i>Mentha aquatica</i>	SA	Lf	E	Condiment. Dysentery
Water mint				
<i>Mentha sylvestris</i>	SA. WA	Lf	E	Condiment. Diuretic
Wood mint				
<i>Mentha rotundifolia</i>	NA	Lf	E	Flavor. Snuff
Round leaved mint				
<i>Mimulus kumel</i> *	Ab	Ex	MR. Gutta-percha	Dressing
False gutta-percha				
<i>Mimulus schimperi</i> *	Ab	Ex	MR. Gutta-percha	Dressing
False gutta-percha				
<i>Myrsine fragrans</i> *	M. WA	Sd	E. Pinen. Camphen	Condiment
Nutmeg			F. Myristin	
<i>Origanum majorana</i> *	NA	Lf	E. Majorana oil	Condiment
Marjoram				
<i>Othonna furcata</i> *	SA	Ex	MR	Dressing
South African bdellium				
<i>Petroselinum sativum</i>	A	Lf	E. Apiol	Diuretic. Flavor
Parsley				
<i>Pimenta officinalis</i> *	NA	Ft	E. Eugenol	Flavor
Allspice				
<i>Pimpinella anisum</i> *	NA	Ft	E. Anethol	Flavor
Anise				
<i>Piper capense</i> *	SA	Ft	E. Chavicin	Diuretic. Vermifuge
South African pepper			A. Piperin	Flavor
<i>Piper clusii</i> *	WA	Ft	E. Chavicin	Flavor
Cubeb pepper. Ashanti pepper			A. Piperin	
<i>Piper Guianense</i> *	WA	Ft	E. Chavicin	Flavor
Wild pepper			A. Piperin	Rheumatism

TABLE 11—Continued

Name	Region	Part	Principle	Use
<i>Piper umbellatum</i> *	WA	Ft	E. Chavicin	Diuretic
Wild pepper			A. Piperin	Flavor
<i>Pistacia lentiscus</i> *	NA	Ex	R. Masticin	Dressing
Mastic			T	
<i>Prunus amygdala amara</i> *	NA	Sd	H	Flavor
Bitter almonds				
<i>Punica granatum</i> *	NA, WA	Bk	A. Pelletierine	Tapeworm. Dysentery
Pomegranate				
<i>Quercus infectoria</i> *	NA, WA	Gall	T. Tannic acid	Astringent
Oak galls				
<i>Rosmarinus officinalis</i> *	NA	Lf	E. Borneol	Diuretic
Rosemary				
<i>Rubia tinctorum</i> *	NA	Rt	D. Alizarin	Cholagogue
Madder				
<i>Sesamum indicum</i> *	A	Sd	F. Oil of sesame	Emollient
Tilseed				
<i>Styrax benzoin</i> *	WA	Ex	MR. Benzoic and Cinnamic acids	Dressing
Benzoin			MR	Dressing
<i>Symphonia globulifera</i> *	WA, WT	Ex		
(Varnish tree)				
<i>Tamarindus indicus</i> *	NA, TA	Ft	M. Galactan	Laxative. Febrifuge. Dressing
Tamarind				
<i>Thymus vulgaris</i> *	NA	Lf	E. Thymol	Condiment. Flavor
Thyme				
<i>Trachylobium hornemannianum</i> *	EA	Ex	MR. Trachylol	Dressing
Zanzibar copal				
<i>Xylofia ethiopica</i> *	A	Sd	E R	Counterirritant. Roundworm
Guinea pepper				
<i>Zingiber officinale</i> *	A	Rt	R. Gingerol	Carminative tonic
Ginger				

TABLE 12  
DRUG PLANTS CULTIVATED IN AFRICA

<i>Name</i>	<i>Region</i>	<i>Part</i>	<i>Principle</i>	<i>Use</i>
<i>Abrus precatorius</i> Jequirity	A	Sd	P. Abrin	Ophthalmia. Snake bite. Ulcers. Vermifuge
<i>Acorus calamus</i> Sweet flag	A	Rt	B. Acorin	Demulcent
<i>Agrimonia eupatoria</i> Agrimony	A	Lf	T B	Roundworm. Stomachic
<i>Anacyclus pyrethum</i> * Spanish pellitory	NA	Rt	A. Pyrethrine	Bronchitis. Indigestion
<i>Areca catechu</i> * Areca nut	E.A. M	Seed	A. Arecoline Arecaine	Tapeworm. Antidysenteric
<i>Argemone mexicana</i> Frickly poppy	A	Lx. Lf	A. Protopine	Narcotic. Anodyne. Wound dressing. Warts
<i>Artemisia absinthium</i> Absinth	NA	Tops	E. Absinthol B. Absinthin	Narcotic. Indigestion
<i>Borago officinalis</i> * Borage	NA. WA	Lf	M R	Colds
<i>Boswellia carteri</i> * Olibanum	EA	Ex	R. Olbano-resin B. Bassorin	Tonic. Diuretic
<i>Boswellia dalzielii</i> * Olibanum	WA	Ex	R. Olbano-resin B. Bassorin	Syphilis
<i>Boswellia hildebrandtii</i> * Olibanum	EA	Ex	R. Olbano-resin B. Bassorin	Tonic
<i>Calendula officinalis</i> Marigold	NA	Fl	B. Calendulin	Febrifuge
<i>Cannabis indica</i> Haschich	NA. EA	Tops Ft	R. Cannabinol	Narcotic

TABLE 12—Continued

Name	Region	Part	Principle	Use
<i>Catha edulis</i>	NA, EA	Lf	A. Cathine	Tonic
Catha tea			A. Celastrine	
<i>Chenopodium ambrosioides</i> *	A	Tops	E. Ascarodol	Roundworm. Insecticide
American wormseed				
<i>Cinchona calisaya</i> *	WA	Bk	A. Quinine	Tonic. Malaria
Peruvian bark			Cinchonine	
<i>Citrullus colocynthis</i> *	A	Ft	R. Colocynthin	Purge. Poultrice
Colocynth				
<i>Colchicum autumnale</i> *	NA	Rt	A. Colchicine	
Meadow saffron				
<i>Croton tiglium</i> *	NA	Sd	F. Croton oil	Purgative
Croton oil			P. Crotin	
<i>Daphne gnidium</i> *	NA	Bk	R	Alterative
Mezereum				
<i>Datura alba</i>	EA	Lf	A. Hyoscine	Smoked for asthma
White thorn apple			Hyoscyamine	
<i>Datura fastuosa</i>	EA	Lf	A. Hyoscine	Intoxicant
			A. Hyoscyamine	
<i>Datura innoxia</i>	EA	Lf	A. Hyoscine	Intoxicant
			Hyoscyamine	
<i>Datura metel</i>	WA	Lf	A. Hyoscine	Pain. Asthma
			Hyoscyamine	
<i>Datura stramonium</i>	A	Lf	A. Hyoscine	Intoxicant. Pain. Anodyne dressing
Thorn apple			Hyoscyamine	
<i>Delphinium staphisagria</i> *	NA	Sd	A. Delphinine	Antiparasitic
Stavesacre				

TABLE 12—Continued

Name	Region	Part	Principle	Use
<i>Eballium elaterium</i>	NA	Ft	G. Elaterin	Purgative
Squirting cucumber		Lf		Purgative. Snuff
<i>Eleusine indica</i>	WA	Lf		Hemoptysis
Bermuda grass	A	Lf	E. Eucalyptol	Colds. Antiparasitic
<i>Eucalyptus globulus</i>				
Blue gum tree	M	Lf	E	Carminative
<i>Eupatorium agalana</i>				
Mauritian tea	Congo	Lf	E	Stimulant. Diuretic. Sudorific
<i>Eupatorium cytopanoides</i>				
Amazon tea	NA	Lx	MR. Ammoniac	
<i>Ferula tingitana</i> *				
African ammoniac	A	Lf	M. D. Hibiscetin	Scorbutus. Diuretic
<i>Hibiscus sabdariffa</i>		Fl	M	Cough. Wound dressing
African mallow	NA	Lf	A. Hyoscine	Local for pain
<i>Hyoscyamus albus</i>			Hyoscyamine	
White henbane	Ab	Ft	X. Rottlerin	Tapeworm
<i>Mallotus philippensis</i> *		Bk	T	
Kamala	WA. SA	Bk	B. Mangrovin	Roundworm. Antiparasitic
<i>Melia azedarach</i>				
✓ Pride of India	NA	Sd	A. Nigelline	Laxative. Expectorant
<i>Nigella damascena</i> *				
✓ Black cummin	NA	Sd	A. Nigelline	Diuretic. Roundworm
<i>Nigella sativa</i>				Same
Nutmeg flower				

TABLE 12—Continued

Name	Region	Part	Principle	Use
<i>Ocimum canum</i>	TA	Lf	E. Thymol	Dysentery. Malaria. Sternutatory
Fever leaf				
<i>Ocimum gratissimum</i>	M	Lf	E	Tonic. Expectorant. Antispasmodic
<i>Ocimum viride</i>	WA	Lf	E. Thymol	Febrifuge
Fever leaf				
<i>Nerium oleander</i> *	NA	Lf	C. Neriiin	Antiparasitic. Arrow poison
Oleander				
<i>Papaver somniferum</i> *	NA	Lx (Ft)	A. Morphine Papaverine	Sedative. Diarrhea
Opium poppy				
<i>Papaver rhoeas</i>	NA	Fl	A. Papaverine	Sedative
Red poppy				
<i>Parietaria officinalis</i> *	NA	Lf	Potash	Diuretic
Wall pellitory				
<i>Ricinus communis</i> *	A	Sd	F. Castor oil P. Ricin	Cathartic. Emollient
Castor oil				
<i>Ruta graveolens</i>	NA	Lf	G. Rutin E. Oil of rue	Febrifuge
Rue				
<i>Swerdia chirata</i>	SA	Plant	B. Chiratin	Tonic
Chirata				
<i>Trigonella fenumgræcum</i> *	NA	Sd	A. Trigonelline B	Expectorant
Fenugreek				
<i>Urginea scilla</i> *	NA	Rt	C. Scillitoxin	
Squill				

TABLE 13  
DRUG PLANTS USED AS POISONS

Name	Region	Part	Principle	Use
<i>Abrus precatorius</i>	A	Sd	P. Abrin	Ordeal
<i>Acokanthera abyssinica</i>	Ab	Wd	C. Acocantherin	Arrow
" <i>frictorium</i>	WA	Wd	C. Ouabain	"
" <i>longiflora</i>	WA	Wd. Rt	C. "	"
" <i>schimperi</i>	EA. CA	Wd. Rt	C. " Acocantherin	"
" <i>spectabilis</i>	SA	Wd	C. Acocantherin	"
" <i>venenata</i>	TA	Wd	C. "	"
<i>Adenium boehmianum</i>	SA	Lx	C. Echugin	"
" <i>coetaneum</i>	EA	Lx	C. "	"
" <i>honghel</i>	TA. SA	Lx	C.	Homicidal
" <i>multiflorum</i>	EA. SA	Lx	C	Ordeal
" <i>obesum</i>	EA	Lx	C	Fish
" <i>somalense</i>	EA	Lx	C. Somalin	Homicidal
<i>Albizia versicolor</i>	EA	Rt		"
<i>Anacardium occidentale</i>	Congo	Bk		"
<i>Anona squamosa</i>	WA	Rt		Vermin
<i>Antiaris toxicaria</i>	EA	Lx	C. Antiarin	Arrow
<i>Balanites egyptica</i>	TA	Rt. Lf	S	Fish
" <i>glabra</i>	EA	Bk		Homicidal
<i>Barringtonia racemosa</i>	M	Sd	S. Barringtonin	Fish
<i>Baphane disticha</i>	TA. SA	Rt	A. Haemanthine	Arrow. Homicidal
<i>Barcea africana</i>	SA	Bk		Fish
<i>Calatropis procera</i>	WA	Lx	A. Mudarin	Arrow
<i>Cassia didymobotrya</i>	EA	Lf		Fish
<i>Cerbera tanghin</i>	M	Sd	C. Tanghinin	Arrow. Ordeal

TABLE 13—Continued

Name	Region	Part	Principle	Use
<i>Combretum confertum</i>	CA	Sd		Arrow, Ordcal
" <i>grandiflorum</i>	Congo	Sd		"
<i>Conarbonea camporum</i>	EA	Rt		Homicidal
<i>Crotalaria brevidens</i>	Congo	Rt	A. Monocrotaline (?)	Arrow
" <i>omnoides</i>	Congo	Rt	"	"
<i>Croton lobatus</i>	NA, TA	Lx	A. Crotin	"
" <i>oligandrus</i>	WA	Lx	"	"
<i>Cucumis aculeatus</i>	EA	Ft	P. Cucumin	Homicidal
" <i>africanus</i>	EA	Ft	"	"
" <i>figarei</i>	EA	Ft	"	"
<i>Cynanchum sarcostemmatoides</i>	EA	Lf	G. Cynanchotoxin	Fish
<i>Detarium senegalense</i>	WA	Bk	"	Arrow
<i>Dichapetalum acuminatum</i>	Congo	Bk, Lf	X. Monofluoroacetic acid (?)	"
" <i>bussei</i>	Congo	Bk, Lf	"	"
" <i>lolo</i>	Congo	Bk, Lf	"	"
" <i>lujazi</i>	Congo	Bk, Lf	"	"
" <i>macrocarpum</i>	EA	Bk, Lf	"	"
" <i>mombongense</i>	Congo	Bk	"	"
" <i>mombutense</i>	Congo	Bk	"	"
" <i>mossambicense</i>	EA	Bk, Lf	"	"
" <i>toxicarium</i>	WA	Bk, Lf	"	"
" <i>stuhlmannii</i>	EA	Bk, Lf	"	"
" <i>venenatum</i>	SA	Bk, Lf	"	"
<i>Dioclea reflexa</i>	CA		A. Physostigmine	Fish
<i>Dioscorea rupicola</i>	SA		A. Dioscoreine	Homicidal
" <i>sensibaricensis</i>	EA		"	"



TABLE 13—Continued

Name	Region	Part	Principle	Use
<i>Elaeodendron croccum</i>	SA	Rt		Ordeal
<i>Erythoxylum monogynum</i>	EA	Lf		Homicidal
<i>Erythrophloeum couningo</i>	M	Bk		Ordeal
“ guineense	TA	Bk	C. Erythrophlein	Ordeal, Arrow
<i>Euphorbia calicyma</i>	CA	Lx	C.	Arrow
“ candelabrum	CA	Lx	R	“
“ dinteri	SA	Lx	R	“
“ matabelenis	SA, EA	Lx	R	“
“ media	SA	Lx	R	“
“ neglecta	EA	Lx	R	Fish
“ lathyris	EA	Lx	R	Homicidal
“ noxia	EA	Lx	R	Arrow
“ poissoni	EA	Lx	R	“
“ tirucalli	EA	Lx	R	Fish, Homicidal
“ unispina	WA	Lx	R	Arrow
<i>Fluggea microrcarpa</i>	WA	Bk	T	Fish
<i>Gleditschia africana</i>	EA	Bk	C. Erythrophlein, A. Muawine	Ordeal
<i>Gloriosa simplex</i>	EA	Rt	A. Superbine, Gloriosine	Homicidal
<i>Hyoxyamus feleziez</i>	NA	Lf	A. Hyoscine, Hyoscyamine	“
<i>Hypoxis latifolia</i>	SA	Rt	A. Haemanthine	Vermis
<i>Jatropha globosa</i>	SA	Rt	A. Hyenanchine	Hyenas
<i>Knechtionia bracteata</i>	SA	Lf	X. Anemonol	Homicidal
<i>Lasiacisphora kraussii</i>	WA	Rt	R	Arrow
<i>Maerua angolensis</i>	EA	Rt		Homicidal
<i>Marrubium subinum</i>	NA	Lf	B. Marrubiin	Fish
<i>Melia azedarach</i>	SA, EA	Ft	P (?)	Homicidal

TABLE 13—Continued

Name	Region	Part	Principle	Use
<i>Menabea venenata</i>	M	Rt	C	Ordeal
<i>Morelia senegalensis</i>	WA			Fish
<i>Mucuna flagellipes</i>	CA	Sd	A	Arrow
<i>Mundulea suberosa</i>	TA	Lf	S. Derrid	Fish
<i>Nerium oleander</i>	EA	Lf	C. Neriin	Arrow
<i>Neouboldia laevis</i>	Congo	Bk	T	Fish
<i>Obetia pinnatifida</i>	EA	Lf		Rats
<i>Ophiocaulon eiscampeloides</i>	WA	Lf	P	Fish
<i>Palisota bartleri</i>	CA	Lf		Arrow
<i>Parikia biglobosa</i>	TA	Ft	X	Fish
<i>Periploca nigrescens</i>	Congo	Lx	C. Periplocin	Arrow
<i>Phaseolus lunatus</i>	EA	Sd	H	"
<i>Phyllanthus engleri</i>	CA	Rt	P. Phyllanthin	Homicidal
<i>Physostigma venenosum</i>	WA	Sd	A. Physostigmine	"
<i>Phytolacca abyssinica</i>	EA	Lf	X	Ordeal. Arrow
<i>Pipodemia africana</i>	Congo			Homicidal
<i>Randia dumetorum</i>	EA	Ft	S	Ordeal
" <i>nilotica</i>	WA	Ft	S	Fish
<i>Sopium madagascariense</i>	EA. M	Lf		"
<i>Sarco-sphalus esculentus</i>	WA	Bk	A. Doundakine	Arrow
" <i>diderrichii</i>	WA	Bk	"	"
<i>Securidaca longipedunculata</i>	Congo	Bk	A.	"
<i>Sophora tomentosa</i>	EA		A. Sophorine	Ordeal
<i>Spondianthus preussii</i>	WA	Bk		Fish
<i>Strophanthus bracteatus</i>	TA	Sd	C. Strophanthin	Rats
" <i>courmonti</i>	EA	C.	"	Arrow
				"
				Ordeal

TABLE 13—Continued

Name	Region	Part	Principle	Use
<i>Strophanthus deverei</i>	Congo	Sd	C. Strophanthin	Arrow
" <i>amini</i>	E.A.	Sd	"	"
" <i>grabus</i>	WA	Sd	"	"
" <i>hispidus</i>	WA	Sd	"	"
" <i>holosericens</i>	Congo	Sd	"	"
" <i>kombé</i>	T.A.	Sd	"	"
" <i>preussii</i>	TA	Sd	"	"
" <i>sarmentosus</i>	WA	Sd	"	"
" <i>peterstianus</i>	E.A.	Sd	"	"
" <i>tholloni</i>	C.A.	Sd	"	"
" <i>verrucosus</i>	E.A.	Sd	"	"
<i>Strychnos icaja</i>	WA	Bk	A. Strychnine	Ordeal
" <i>kipapa</i>	WA	Bk	"	"
" <i>spinosa</i>	E.A.	Rt	"	"
<i>Suaizia madagascariensis</i>	T.A. M	Ft	"	Ordeal
<i>Synadenium piscatorium</i>	E.A.	Sd	"	Fish
<i>Tephrosia candida</i>	Congo	Rt. Lf	X. Tephrosin	"
" <i>capensis</i>	SA	Rt	"	Arrow
" <i>densiflora</i>	SA	Rt	"	"
" <i>elegans</i>	SA	Rt	"	"
" <i>lupinifolia</i>	SA	Rt	"	Homicidal
" <i>macrohoda</i>	SA	Rt	"	Fish. Insect
" <i>toxicaria</i>	SA. WA	Rt	"	Arrow. Fish
" <i>vogelii</i>	Congo	Rt. Lf	"	"
<i>Vernonia hildebrandtii</i>	E.A.	Lf	A	"
<i>Zizyphus jujuba</i>	Ab	Bk	T	Fish



TABLE 14—Continued

<i>Name</i>	<i>Region</i>	<i>Part</i>	<i>Principle</i>	<i>Medical Indications</i>
<i>Acokanthera spectabilis</i>	SA	Wd	C. Ouabain	Snakebite. Tapeworm
" <i>venenata</i>	EA, SA	Wd	C.	"
<i>Acridocarpus natalitius</i>	SA, EA	Rt		Purgative. Tonic
" <i>plagiopterus</i>	WA	Rt		" Vermifuge
<i>Adansonia digitata</i>	TA	Lx. Lv	M	Poultice. Pain. Cough
		Bk	A. Adansonine	Enteritis. Malaria
		Ft	B	Dysentery. Malaria
" <i>madagascariensis</i>	M	Ft	B	"
<i>Ademia venenata</i>	EA	Lf. Wd	P. Modeccin	Vesicant. Wounds
<i>Adenium oleifolium</i>	SA	Lx. Rt	C. Echugin	Tonic. Snakebite
" <i>honghel</i>	EA	Lx	C.	Wound dressing
<i>Adina rubrostipulata</i>	TA	Bk	A. Mitraphylline	Dysentery. Fever
			A. Rubradinene	Roundworms
<i>Agapanthus umbellatus</i>	SA	Rt	C. Scillitoxin	Heart disease
<i>Agelaea emetica</i>	M	Lf	E	Emetic
" <i>lamarckii</i>	M	Lf	E	Gonorrhea
" <i>thouarsiana</i>	M	Rt	T	Dysentery
" <i>villosa</i>	WA	Lf		"
<i>Ageratum conyzoides</i>	TA	Lf	E	Fever. Purgative. Wound and Ulcer dressing
		Rt		Colic
<i>Ayuga iwa</i>	NA	Lf	E	Snuff. Malaria. Wounds
" <i>ophydis</i>	SA	Lf	E	Menstrual pain
<i>Albizzia amara</i>	GA	Ft	S. Musennin	Emetic. Cough. Malaria
" <i>anthelmintica</i>	TA, SA	Bk. Rt	X. Kosotoxin	Tapeworm. Gonorrhea
" <i>antunarsiana</i>	SA	Bk	T. S. Musennin	Wound dressing
" <i>brachycalyx</i>	EA	Bk		Rheumatism
" <i>fastigiata</i>	M	Bk. Lf. Wd	T	Diarrhea. Ophthalmia
" <i>lophantha</i>	SA	Rt		After-pains
" <i>maranguensis</i>	EA	Bk	S. Musennin	Coughs

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Albizzia obliquifoliata</i>	Congo	Bk	T	Dysentery
" <i>zygia</i>	WA	Lf	T	Diarrhea
<i>Alchornea cordifolia</i>	WA	Lf	T, B, Alchornin	Ulcers, Ophthalmia, Gonorrhoea, Toothache
<i>Alphidea citaris</i>	SA	Rt	R	Coughs
" <i>amatymbica</i>	SA	Rt	R	Snuff for colds
" <i>setifera</i>	SA	Rt	R	Coughs
<i>Allophylus alnifolius</i>	EA	Rt	T	Dulasi
" <i>zylanicus</i>	TA	Rt	T	Snakebite, Syphilis
<i>Aloe ferox</i>	SA, WA	Lf	Q, Aloin	Ophthalmia, Syphilis
" <i>latifolia</i>	SA	Lf	Q, "	Wounds, Burns, Ringworm
" <i>saponaria</i>	SA	Lf	Q, "	Boils, Ringworm
" <i>tenuior</i>	SA	Rt	Q, "	Cathartic, Tapeworm
" <i>volkenstii</i>	EA	Lx	Q, "	Burns
<i>Alpinia galanga</i>	CA	Rt	E, B, Galangin	Cough, Colic
" <i>officinarium</i>	CA	Rt	E, B, "	" "
<i>Alstonia congenis</i>	WA	Rt, Lf	A, Ditamine	Fever, Rheumatism
<i>Alysicarpus glumaceus</i>	EA	Lf	T, M	Thrush, Veldt-sores
" <i>rugosus</i>	SA	Rt, Lf	T, M	Fever, Cough, Thrush
" <i>zyheri</i>	SA	Pl	G, Kellin	Impotence
<i>Amni visnaga</i>	NA	Ft	G, Kellin	Colic, Renal, Intestinal
<i>Amomum angustifolium</i>	M	Rt		Cholera
" <i>cereum</i>	WA	Rt		Roundworm
" <i>danielli</i>	M	Rt		Cholera
" <i>giganteum</i>	WA	Stem		Colic, Ophthalmia, Bleeding
" <i>stipulatum</i>	WA	Rt		Roundworm
<i>Anagyris fetida</i>	WA	Pl	A, Anagyryne	" " Purge, Emmenagogue
<i>Anaphrenium mucronatum</i>	EA, TA	Rt, Lf	T	Tapeworm, Dysentery
" <i>paniculosum</i>	SA	Bk	T	Bronchitis
" <i>reticulatum</i>	EA	Bk	T	Ophthalmia

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Andira inermis</i>	EA	Bk	A. G. Andirin	Roundworm. Narcotic
" <i>surinamensis</i>	WA	Bk	G. Surinamin	"
<i>Andropogon caesius</i>	EA	Pl	E. Citronellol	Snakebite
" <i>nardus</i>	SA	Pl	E. Geraniol	Worms. Fever. Colds
" <i>schoenanthus</i>	WA	Pl	E. "	Fever. Colds. Gonorrhea
<i>Anemone cafra</i>	SA	Rt	X. Anemonol	Snuff for colds. Cathartic
<i>Anogeissus latifolius</i>	WA	Bk	T	Diarrhea. Fever
" <i>schimperi</i>	WA	Bk	T	Tapeworm
<i>Anona chrysophylla</i>	TA	Bk. Lf	T	Snakebite. Buboes
" <i>muricata</i>	TA	Pl	T	Cough. Fever. Spasms
" <i>palustris</i>	WA	Bk. Rt	T	Dysentery. Worms
" <i>reticulata</i>	WA	Ft	T. A. Anonaine	Coughs
" <i>senegalensis</i>	TA	Bk	T	Dysentery
" <i>squamosa</i>	WA	Rt	T	Worms. Guineaworm. Dysentery
<i>Anthocheilista rhizophoroides</i>	M	Bk		Topical astringent
" <i>zambesiaca</i>	SA	Bk		Tonic. Cathartic. Fever
<i>Antidesma venosum</i>	SA. WA	Lf	A	Roundworm
<i>Aphloia madagascariensis</i>	M	Lf		Indigestion. Colic
" <i>mauritanica</i>	M	Lf		Cholagogue. Diuretic
<i>Apodytes dimidiata</i>	SA	Rt		Roundworm
<i>Artemisia afra</i>	SA. EA	Lf	E	Coughs. Colds. Fever
" <i>herbo-alba</i>	NA	Lf	E. Eucalyptol	Colic. Indigestion
" <i>judaea</i>	NA	Pl	E. X. Santonin	Worms. Colic. Rheumatism
" <i>ramosa</i>	NA	Pl	A	"
<i>Artocarpus integrifolia</i>	WA	Rt	T	Astringent
<i>Asparagus falcatus</i>	EA. SA	Rt	X. Asparagin	Worms. Ulcers
<i>Aspidium athamanticum</i>	WA. SA	Lf. Rt	L. Aspidin	Worms. Gonorrhea
<i>Asystasia calycina</i>	WA	Lf	A	Snakebite. Eases labor

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Balanites egyptica</i>	A	Lf. Rt. Bk	F S	Purge. Roundworms. Emetic.
<i>Barosma betulina</i>	SA	Lf	E. R. B. Barosmin	Diuretic. Gonorrhœa
“ <i>crenulata</i>	SA	Lf	E. R. B.	“
<i>Bauhinia adamsoni</i>	WA	Rt	T	Expectorant. Astringent. Fever. Leprosy
“ <i>reticulata</i>	WA	Rt. Bk. Lf	T	Astringent. Roundworm. Coughs. Malaria
“ <i>ryfescens</i>	WA	Rt	T	Astringent. Febrifuge
<i>Berkheya setifera</i>	SA	Rt. Lf	T	{ Ophthalmia. Indigestion. Rheumatism.
“ <i>speciosa</i>	SA	Rt. Lf		{ Gonorrhœa.
<i>Bidens hildebrandtii</i>	EA	Lf		On carbuncles
“ <i>bispinnata</i>	WA	Juice		Ophthalmia. Otitis
“ <i>pilosa</i>	Congo	Juice		“
<i>Bixa orellana</i>	TA	Lf. Ft	D. Bixin R	Cathartic. Fever
<i>Blalpharis capensis</i>	SA	Pl		Wounds. Snakebite. Toothache. Anthrax
<i>Boerhaavia paniculata</i>	EA	Rt	A. Punarnarine	Diuretic.
“ <i>plumbaginea</i>	NA. TA	Rt	“	Jaundice. Wounds
“	WA	Pl	A.	Cathartic. Cholagogue. Gonorrhœa. Fever
<i>Brachylaena discolor</i>	SA	Lf	T	Roundworms
“ <i>elliptica</i>	SA	Lf	T	Diphtheria (topical). Pneumonia
<i>Brayera anthelmintica</i>	EA. Ab	Fl	X. Kosotoxin	Tapeworm
<i>Bridelia atroviridis</i>	Congo	Bk	T	Expectorant
“ <i>ferruginea</i>	Congo	Bk	T	Roundworm. Cystitis
“ <i>micrantha</i>	WA. EA	Rt		Cathartic
“ <i>scleroneurooides</i>	EA	Rt		Indigestion
<i>Brucea ferruginea</i>	EA	Sd. Rt. Lf	B. Brucamarin	Colic. Dysentery
“ <i>sumatrana</i>	WA	Bk	“	Dysentery. Fever
<i>Bucholzia coriacea</i>	Congo	Ft. Sd	O	Roundworm. Condiment. Expectorant.
<i>Buddleia salviifolia</i>	SA	Rt		Rheumatism
“ <i>madagascariensis</i>	M	Rt		Colic
				Tonic. Expectorant



TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Bulbine alooides</i>	A	Rt	Juice	Diarrhea. Heart stimulant
" <i>asphodeloides</i>	A	Lf		Wound dressing
" <i>latifolia</i>	A	Rt		Rheumatism. Heart stimulant
" <i>natalensis</i>	SA	Rt		Diuretic. On eczema
<i>Buphane disticha</i>	WA. SA	Rt	A. Haemanthine	Wound dressing. Poison
<i>Butea frondosa</i>	WA	Ex	T	Astringent
<i>Caesalpinia bonducella</i>	TA. M	Sd	R. Bonducin	Fever. Malaria. Dyspepsia. Rubefacient.
" <i>crista</i>	WA	Rt		Vesicant
" <i>sepiaria</i>	M	Sd		Fever
<i>Cojanius cajan</i>	EA	Lf. Wd		Vesicant
" <i>indicus</i>	WA	Lf. Rt	T	Cathartic. Emmenagogue
<i>Calophyllum inophyllum</i>	TA. M	Lf. Bk	T	Diarrhea. Toothache
<i>Calotropis procera</i>	Desert	Lx	E T	Astringent
<i>Canarium madagascariense</i>	M	Ex	R M	Ophthalmia. Ulcers. Rubefacient
" <i>schweinfurtti</i>	TA	Ex	R	Purge. Sternutatory
<i>Capparis albitrunca</i>	EA	Ex	R. African elemi	Dental caries
" <i>aphylla</i>	NA	Ft	O	Roundworm. Colic. Dysentery. Gonorrhea
" <i>corymbifera</i>	WA. SA	Rt. Lf	B O	Epilepsy ✓
" <i>spinosa</i>	NA	Rt	O	Jaundice. Large spleen
" <i>tomentosa</i>	WA. CA	Rt. Bk	O	Counterirritant. Expectorant. Diuretic
<i>Carapa procera</i>	WA	Sd	R F	Diuretic. Rheumatism
<i>Cardiospermum grandiflorum</i>	WA	Bk	S	Wounds. Leprosy. Snakebite. Ophthalmia
" <i>haticacabum</i>	SA. WA	Lf	S	Roundworm. Purgative. Parasites
<i>Carissa edulis</i>	TA	Rt	S	Fever. Malaria. Dysentery
<i>Carum ammoides</i>	NA	Sd	E. Thymol	Scabies. Sores ✓
			C. Carissin	Diarrhea. Colds
			E. Thymol	Emetic. Purgative
				Tonic. Abortifacient. Coughs
				Leprosy ✓

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Carum allanticum</i>	NA	Sd	E. Thymol	Carminative. Dysuria
" <i>copticum</i>	Egypt	Sd	E.	" Indigestion
<i>Cassia abbreniata</i>	EA	Rt. Bk	T	Diarrhea. Malaria
" <i>abusus</i>	TA	Sd	P	Purge. Roundworm. Ophthalmia
" <i>acutifolia</i>	Desert	Lf. Ft	Q T	Cathartic. On burns
" <i>alata</i>	TA	Lf	Q T	" On skin lesions
" <i>angustifolia</i>	EA	Lf	Q	Tonic. Fever
" <i>auriculata</i>	WA	Lf. Sd. Rt	B. Sennapicrin	Malaria. On ulcers
" <i>bearcama</i>	EA	Rt. Bk	T	Purge. Febrifuge. Gonorrhoea. On skin lesions
" <i>delagoensis</i>	TA. SA	Lf	Q T	Purge. Fish poison
" <i>didymobotrya</i>	EA	Lf. Rt	Q	Cathartic
" <i>ethiopia</i>	NA	Lf	Q	Black-water fever. Cathartic
" <i>fistula</i>	CA	Ft	Q	Cathartic. On burns
" <i>holosericea</i>	EA	Lf	Q T	" Malaria
" <i>nigricans</i>	WA	Lf	Q T	" Dysentery
" <i>mimosoides</i>	SA	Lf	Q T	" On burns
" <i>obovata</i>	A	Lf. Rt	Q T	" Fever. Malaria
" <i>occidentalis</i>	TA. SA	Lf	Q	"
" <i>podocarpa</i>	WA	Lf	Q	" Fever. On ulcers
" <i>sibiriana</i>	WA	Lf. Ft	Q	" Roundworm
" <i>tora</i>	TA	Lf. Rt	Q	"
<i>Cassythia ciliolata</i>	WA. SA	Pl	T. Laurotetanine	Diuretic. Gonorrhoea. Snakebitc. Delousing
" <i>fliformis</i>	WA. SA	Pl	X. Kosotoxin	Roundworm
<i>Celostia anthelminthica</i>	Ab	Lf. Ft	X.	" Astringent
" <i>argentea</i>	Congo	Sd	X.	"
" <i>laxa</i>	WA	Lf	X.	" Diarrhea
" <i>trigyna</i>	EA	Lf	X.	Heart stimulant
<i>Cerbera tanghin</i>	M	Ft	C. Tanghinin	Sore throat
<i>Chelidonium hirta</i>	SA	Lf		

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Chlorophora excelsa</i>	TA	Rt		Roundworm
<i>Chrysobalanus icaco</i>	WA	Lx	D. Morin	Skin lesions. Gonorrhoea
<i>Cinnamomum fragrans</i>	M	Lf	T	Astringent
<i>Cissampelos capensis</i>	SA	Bk	E	Carminative. Tapeworm
“ <i>parvira</i>	SA	Lf. Rt.	{ A. Cissampeline	Syphilis. Snakebite
“ <i>torulosa</i>	TA. SA	Lf. Rt.	{ A. Sepecline	Diuretic. Febrifuge
<i>Clausemia anisata</i>	SA	Lf. Rt.	{ A. Pelosine	Scrofula. Toothache
“ <i>inequalis</i>	WA	Rt	E	Migraine. Toothache
<i>Clematis bojeri</i>	SA	Rt. Lf	E	Fevers. Tapeworm
“ <i>flammula</i>	M	Lx	X. Anemonol	{ Caustic to skin tumors and leprosy
“ <i>brachiata</i>	M. NA	Lx	X. “	{ Powder as snuff
“ <i>grandiflora</i>	SA	Rt. Lf	X. “	{ Vesicant
“ <i>simensis</i>	WA	Rt. Lf	X. “	{ Counterirritant
“ <i>thunbergii</i>	Congo	Lf	X. “	{ Colic. Syphilis. Leprosy
<i>Cleome ciliata</i>	WA	Rt. Lf	X. “	{ Local for deafness
“ <i>pentaphylla</i>	WA	Lf	E or O	{ Earache. Counterirritant
<i>Clerodendron buchholzii</i>	TA	Lx	O	{ On bruises, sores, snakebites
“ <i>polyccephalum</i>	TA	Lf}	{ T. B. Chirettin	Purgative
“ <i>capitatum</i>	TA	Lf}	B. Chirettin	Purgative. Fevers. Coughs. Snakebite
“ <i>glabrum</i>	CA	Rt	T	Diarrhea. Spider bite
“ <i>heterophyllum</i>	SA. Congo	Lf. Rt		Purge. Roundworm. Fever
“	M	Lf		Expectorant
“	Congo	Rt		Large spleen
“ <i>johnstoni</i>	EA	Lf		Muscular rheumatism
“ <i>myricoides</i>	EA	Rt		On sores and snakebite
“ <i>sibeanum</i>	WA	Lf		Roundworm
“ <i>splendens</i>	TA	Lf		On burns
“	Congo	Rt		
“ <i>umbellatum</i>	WA	Lf		

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Clerodendron volubile</i>	WA	Lf		On wounds. Impotence
<i>Clivia miniata</i>	SA	Rt		Snake bite. Fever
			A. Lycorine	Leprosy
<i>Cluytia abyssinica</i>	EA	Rt	A. Cliviine	Enlarged spleen
" <i>hirsuta</i>	A	Lf	G. Cluytiarol	Fever. Anthrax. Tonic
" <i>pulchella</i>	SA	Lf	A	Diarrhea. Indigestion
" <i>stimpilis</i>	SA	Lf		"
<i>Cluytis ferruginea</i>	WA	Lf		On wounds. Carious teeth
		Lf		Cathartic
" <i>trifolia</i>	WA	Lf		Sore throat
<i>Combretum aculeatum</i>	WA	Rt		Dysentery
" <i>apiculatum</i>	SA	Rt	R (?)	Purge. Roundworm. Wound dressing
" <i>erythrophyllum</i>	SA	Rt		Enteritis
" <i>glutinosum</i>	WA	Lf		Purgative
" <i>greenwayi</i>	EA	Lf		Bronchitis
" <i>guenzii</i>	EA. SA	Rt		"
" <i>micranthum</i>	WA	Lf		Purge. Snakebite. Wound dressing
" <i>multispicatum</i>	CA	Rt		Purge. Cholagoguc. Yellow fever
<i>Commelina africana</i>	SA. Congo	Rt		Purge. Roundworm. Diuretic
" <i>benghalensis</i>	EA	Juice	M	Fumes from burnt root in leprosy
" <i>madagascaria</i>	M	Pl		Syphilis. Weak heart
" <i>nudiflora</i>	WA	Lf		Ophthalmia. Sore throat
<i>Commiphora africana</i>	TA	Ex	M	Diarrhea. Dysentery
" <i>boiviniana</i>	EA	Bk	MR. Bdellium	Ophthalmia. Bubo
" <i>caryeifolia</i>	EA	Lf	MR	Plasters. Spasms. Fever
" <i>hodai</i>	EA	Ex	MR	Dysentery
" <i>pilosa</i>	EA	Ex	MR	Wound dressing
			MR	Bubo dressing
			MR	Snakebite

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Commiphora zimmermannii</i>	EA	Bk		Indigestion
<i>Conocarpus africanus</i>	WA	Bk	T	Astringent. Tapeworm. Wounds
<i>Convolvulus spinosus</i>	WA	Sd. Rt		Cathartic. Gonorrhœa
“ <i>hastatus</i>	SA	Rt		Toothache
<i>Conyza egyptica</i>	M	Lf		Astringent. Tonic. Fever
“ <i>incisa</i>	SA	Lf		Catarrh
“ <i>inæfolia</i>	SA	Lf		Ophthalmia. Syphilis
<i>Copaifera mopane</i>	SA	Ex		Wound dressing
“ <i>copallina</i>	WA	Ex		Fever
<i>Corynanthe johimbe</i>	WA	Bk	A. Yohimbine	Fever. Tonic. Galactagogue
“ <i>macroceras</i>	Congo	Bk	A.	“
“ <i>paniculata</i>	Congo	Bk	A.	“
“ <i>pachyceras</i>	WA	Bk	A.	“
<i>Coula edulis</i>	WA	Bk		“
<i>Crassula portulacæa</i>	SA	Pl	T	“
“ <i>lyopodoides</i>	SA	Pl	T	“
“ <i>rubicunda</i>	SA	Pl	T	“
<i>Crataeva religiosa</i>	WA	Lf	S	Diarrhea
<i>Crinum capense</i>	SA	Rt	A. Lycorine	Colic. Indigestion. Rheumatism
“ <i>cochinchinense</i>	M	Rt	A.	Colds. Scrofula
“ <i>giganteum</i>		Rt	A.	Emetic. Diaphoretic
“ <i>kirkii</i>	EA	Rt	A.	Leprosy
“ <i>scabrum</i>	Congo	Rt	A.	Indigestion
“ <i>yuccæiflorum</i>	WA	Rt	A.	Leprosy
<i>Crossopteryx febrifuga</i>	TA	Bk	A	Rubefacient
“ <i>kotschyana</i>	EA	Bk	A	Fever. Malaria. Diarrhea. Colic. Vermifuge.
<i>Crotalaria axillaris</i>	EA	Rt		Ophthalmia. Wounds
“ <i>burkeana</i>	CA	Rt		Fever
				Emmenagogue
				Malaria. Dysentery. Anthrax

TABLE 14—Continued

<i>Name</i>	<i>Region</i>	<i>Part</i>	<i>Principle</i>	<i>Medical Indications</i>
<i>Crotalaria retusa</i>	WA	Rt		Colic. Fever
" <i>thomsoni</i>	EA	Lf		"
<i>Croton griseissimus</i>	SA	Bk	P. Crotin	Cathartic. Fever. Dropsy. Indigestion. Pleurisy
" <i>macroboxus</i>	M	Lf. Rt	P. "	Cathartic
" <i>macrostachys</i>	EA	Bk	P. "	"
" <i>megalocarpus</i>	EA	Bk	P. "	Roundworm
" <i>pseudopulchellus</i>	EA	Rt. Lf	P. "	Asthma. Syphilitic ulcers
" <i>sybioticus</i>	SA	Rt	P. "	Pleurisy. Indigestion
" <i>tiglium</i>	NA	Sd	P. "	Purgative
< <i>Cucumis hirsutus</i>	SA	Rt	P. Cucumin	Expectorant
" <i>myriocarpus</i>	SA	Ft	R. Myriocarpin	Purgative
" <i>pusillatus</i>	Ab	Rt	P. Cucumin	"
<i>Cucurbita maxima</i>	TA	Sd	R. Myriocarpin	Roundworm
<i>Cussonia arborea</i>	TA	Rt	P. Cucumin	Gonorrhea. Emmenagogue
" <i>bojerii</i>	M	Lf	P R	Diarrhea
" <i>spicata</i>	SA	Rt		Emetic
" <i>umbellifera</i>	SA	Lf		Rheumatism. Colic. Insanity
<i>Cyathula geniculata</i>	WA	Rt	T	Dysentery. Scabies. Gonorrhea
" <i>spathulifolia</i>	EA	Ft		Topical leprosy
" <i>genistoides</i>	SA	Lf	B. Cyclopin	Expectorant
" <i>subternata</i>	SA	Lf	B.	Tonic
<i>Cynanchum capense</i>	SA	Lf		Topical on boils
<i>Cyrtanthus obliquus</i>	SA	Rt	A. Lycorine	Bronchitis. Cystitis. Leprosy. Scrofula
<i>Daemia cordata</i>	NA	Lx	D G	Topical on skin lesions
" <i>extensa</i>	WA	Lf	G	Expectorant
<i>Dalbergia melanoxylon</i>	EA	Lf. Bk	T E	Emetic. Expectorant. Fever. Skin lesions
" <i>saxatilis</i>	WA	Rt	T E	Colic. Toothache
" <i>stuebelmannii</i>	EA	Lf. Bk	T E	Topical, skin lesions
		Rt		Emetic

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Danais fragrans</i>	M	Rt. Lf	B. Danaidin	Fever. Wound dressing
<i>Daniella oliveri</i>	Congo	Ex	R	Gonorrhea. Dysentery
<i>Desmodium adscendens</i>	WA	Lf	T	Colic. Coughs. Fever
" <i>latifolium</i>	Congo	Lf		Pertussis. Wound dressing
" <i>mavritanum</i>	WA	Lf		Skin lesions
" <i>scalpe</i>	EA	Lf		Colic
<i>Diatarium senegalense</i>	WA	Rt. Bk. Ft		Cough. Fever. Anemia
<i>Dichapetalum toxicarium</i>	WA	Bk	X. Monofluoroacetic acid	Coughs. Rheumatism
<i>Dichrostachys glomerata</i>	TA	Lf		Indigestion. Diarrhea
"		Bk		Snakebite. Roundworm. Expecto- rant
"	TA	Rt		Purgative. Expecto- rant. Gonorrhea
"	M	Rt		Syphilis. Diuretic. Carious teeth
<i>Dicoma anomala</i>	SA	Rt		Dentifrice
"	SA	Rt		Colic. Dysentery. Syphilis— Expecto- rant
"	WA	Pl		Topical on infected wounds
<i>Diospyros megasepala</i>	M	Lf. Bk	T	Roundworm. Ulcer dressing
" <i>melanosylon</i>	TA	Bk. Ft	T	Diarrhea. Hemorrhage. Fever
" <i>perrieri</i>	M	Wd	T	Diarrhea
" <i>mespiliformis</i>	TA	Rt. Lf	T	Dysentery. Leprosy. Vermifuge
<i>Diplorrhynchus mossambicensis</i>	TA	Lf. Rt	R	Indigestion. Hematuria. Syphilis— Diarrhea
<i>Disotis incana</i>	SA	Lf		Rheumatism. Yaws. Vermifuge
" <i>rotundifolia</i>	TA	Pl. Lf		Coughs
" <i>tubulosa</i>	WA	Lf		Expecto- rant
<i>Dodonaea thunbergiana</i>	SA	Wd	S	Fever. Sore throat
" <i>viscosa</i>	M	Lf	S	Diarrhea
<i>Dracarna indica</i>	WA	Ex	R	Fever
" <i>reflexa</i>	M	Ex	R	Flatulence
" <i>stuedneri</i>	EA	Lf		

TABLE 14—Continued

Name	Region	Part	P (?)	Principle	Medical Indications
<i>Dryopteris athamanca</i>	Congo	Rt			Taeniaceae
<i>Eclipta erecta</i>	TA	Lf			Diarrhea. Skin parasites
<i>Elebergia capensis</i>	SA	Bk. Rt	T		Emetic. Expectorant
" <i>meyeri</i>	SA	Rt. Lf	T		Indigestion. Scabies. Roundworm
" <i>senegalensis</i>	WA	Bk	T		Epilepsy
<i>Elaeodendron croceum</i>	SA	Rt			Purgative. Emetic
" <i>oliganthum</i>	M	Rt			Colic
" <i>velutinum</i>	SA	Rt			Diarrhea
<i>Elephantorrhiza burckellii</i>	SA	Rt	T		Diarrhea. Heart trouble
"	SA	Rt			Gonorrhoea. Earache
<i>Embelia concinna</i>	M	Lf. Rt	P. Embelic acid		Colic. Vermifuge
<i>Entada abyssynica</i>	EA	Lf. Bk. Ft	P. "		Tape worm
" <i>kraussi</i>	SA	Lf. Bk	P. "		" "
<i>Emex spinosa</i>	SA	Lf	Q		Cathartic. Indigestion
<i>Entada abyssynica</i>	EA	Rt	S. Entadasaponin		Rheumatism
" <i>africana</i>	WA	Bk. Lf	T		Wound dressing
" <i>natalensis</i>	SA	Rt	S		Chest pains
" <i>scandens</i>	WA. SA	Bk	T		Astringent. Wounds
" <i>stuhlmannii</i>	EA	Lf	S		Galactogogue
" <i>sudanica</i>	WA. CA	Bk	S		Abortifacient
<i>Eriodendron anfractuosum</i>	WA	Lf	R T		Gonorrhoea. Dressing
"		Ex	R T		Diarrhea
<i>Eriosema glomerata</i>	WA	Lf			Wound dressing
" <i>psoralenoides</i>	Congo	Lf. Rt			Syphilis
" <i>salignum</i>	SA	Rt			Expectorant. Diuretic
<i>Eryngium campestre</i>	NA	Rt			Receding gums
" <i>fetidum</i>	WA	Lf			Topical. Ulcers. Headache
<i>Erythrina caffra</i>	SA	Lf	E		Chancroid
" <i>abyssinica</i>	Congo	Bk	T F E		Wound dressing





TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Euphorbia pilulifera</i>	TA	Lx	X. Euphorbon	Roundworm. Ophthalmia. Coughs
“ <i>schimperiana</i>	EA	Rt. Lf	X. “	Purge
“ <i>splendens</i>	M	Rt	X. “	“ . Vesicant
<i>Fagara amanienensis</i>	EA	Bk	R	Toothache
“ <i>dayi</i>	SA	Bk	R	Emetic. Expectorant
“ <i>gillettii</i>	Congo	Bk	R	Antiparasitic
“ <i>hombtei</i>	Congo	Rt	R	Gonorrhea
<i>Ficus capensis</i>	SA	Bk	T	Phthisis. Galactagogue
“ <i>exasperata</i>	TA	Fl	T	Roundworm. Sore throat
“ <i>lepreurii</i>	WA	Lf	T	Herpes zoster
“ <i>natalensis</i>	EA	Ft	M	Cathartic. Vermifuge
“ <i>schimperiana</i>	SA	Rt	T	Colic. Snakebite
“ <i>rubra</i>	M	Bk	T	Anemia
“ <i>sarocoides</i>	M	Bk	T	Diarrhea
“ <i>terebrata</i>	M	Bk	T	Intestinal parasites
“ <i>trichopoda</i>	M	Bk	T	Diarrhea
“ <i>rugosa</i>	WA	Lx	T	Wound dressing
“ <i>sycomoros</i>	TA	Lf. Bk	T	Indigestion. Large spleen
“ <i>vogeliana</i>	TA	Bk	T	Diarrhea. Scrofula. Cough
		Bk	T	Diarrhea. Dysentery. Ulcers
		Bk	T	Wound dressing
		Lx	T. X. Ferment	Sores of yaws
<i>Flemingia congesta</i>	EA	Ft	X. Ferment	Tapeworm
“ <i>grahamiana</i>	WA	Ft. hairs	R. Fleminging	“ . Cathartic
<i>Fluggea microcarpa</i>	TA	Pl. hairs	R. “	Diarrhea. Pneumonia
		Bk	T Lf	Malaria
		Rt	G. Crocin	Tonic. Cough. Syphilis
<i>Gardenia joois-tonantis</i>	WA	Rt	G. “	Skin lesions
“ <i>lutea</i>	WA	Bk	G. “	Black-water fever

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Gardenia rotibarniana</i>	SA	Rt	T Crocin	On burns and Leprosy —
" <i>thunbergia</i>	A	Rt Lf	T G.	Sores of Leprosy — Syphilis —
<i>Geranium canescens</i>	SA	Lx	R	Cathartic
" <i>incanum</i>	SA	Rt	T	Bronchitis
<i>Gisekia pharnacoides</i>	TA, M	Lf	T	Roundworm
<i>Gladiolus sclerolii</i>	SA	Lf, Ft		Tapeworm, Diarrhea
" <i>ludwigii</i>	SA	Rt		Rheumatism
" <i>quartinianus</i>	Congo	Rt		Impotence, Dysmenorrhea
" <i>psittacinus</i>	SA	Rt		Roundworm
<i>Globularia alypum</i>	NA	Lf, Rt	G, Globularin	Dysentery, Coughs
<i>Gloriosa superba</i>	TA, SA	Rt	A, Colchicine	Purge, Syphilis, Wounds
<i>Gnidia vatkana</i>	EA	Rt	R	Ascites, Antiparasitic
<i>Gomphocarpus cornutus</i>	M	Rt, Lf		Purgative
" <i>lincolatus</i>	TA	Rt	C, Uzarin	Emetic, Asthma
" <i>rigidus</i>	SA	Rt	C, "	Roundworm, Stomachic
" <i>schinzianus</i>	SA	Rt	C, "	Dysentery, Colic
" <i>validus</i>	SA	Rt	C, "	Dropsy, Dysentery, Snakebite
<i>Gostipium arboreum</i>	A	Rt	R	Cathartic
" <i>herbaceum</i>	A	Lf		Emmenagogue, Abortifacient
" <i>hirvultum</i>	WA	Sd	F	Dysentery, Topical headache
" <i>longipetala</i>	WA	Lf		Emmollient
" <i>tiliaefolia</i>	M	Lf		Emetic, Gonorrhea
<i>Grewia betulafolia</i>	WA	Bk	T, M	Emmenagogue, Diuretic
" <i>exelsa</i>	EA	Rt	T, M	Antiparasitic
" <i>forbesii</i>	EA	Rt	T, M	Expectorant
" <i>inequilatera</i>	EA	Lf	T, M	Muscular rheumatism
" <i>molles</i>	TA	Lf, Bk	T, M	Measles Wounds, Snakebite; topical

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Gravia occidentalis</i>	SA	Bk	T M	Wounds. Impotence
" <i>populifolia</i>	WA	Rt	T	Antiparasitic
" <i>villosa</i>	CA	Rt		Syphilis. Small-pox
<i>Guiera senegalensis</i>	WA	Lf	B. Celastrin	Bronchitis. Fever
<i>Guiera perpersa</i>	SA	Rt. Lf	B. "	Colds. Colic. Rheumatism
<i>Gymnosporia busifolia</i>	SA	Bk	T	Diarrhea
" <i>obscura</i>	NA. EA	Lf	B. "	Malaria
" <i>putterlickoides</i>	EA	Rt	B. "	Nausea
" <i>senegalensis</i>	TA	Rt	T	Dysentery. Wounds
" <i>montana</i>	WA	Rt	T	Diarrhea. Dysentery
<i>Haemanthus coccineus</i>	SA	Rt	B. "	Colic. Tonic
" <i>multiflorus</i>	WA	Rt	A. Haemanthine	Diuretic. Leprosy
" <i>natalensis</i>	SA	Rt	A. "	Ulcer dressing
<i>Haronga madagascariensis</i>	TA. M	Ex	A. "	Colds. Cough. Fever
		Bk	MR. Guttapercha	Scabies. Tapeworm
		Lf	T	Tapeworm
		Fl	T	Bleeding. Diarrhea. Gonorrhoea. Sore throat.
		Rt	R	Fever
<i>Harrisonia abyssinica</i>	TA			Colic. Puerperal Infection
<i>Helichrysum appendiculatum</i>	TA. SA			Roundworm. Rubefacient
" <i>cordifolium</i>	M			
" <i>gerberifolium</i>	EA			
" <i>hochstetteri</i>	EA			
" <i>leiopodium</i>	SA			
" <i>nudiflorum</i>	SA			
" <i>pedunculare</i>	SA			
" <i>plantago</i>	M			
" <i>tanacetiflorum</i>	M			
		Rt	E. D. Helichrysin	Coughs. Colds
		Lf	"	Wound dressing

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Heteromompha arborecens</i>	SA	Rt		Scrofula. Colic. Dysentery
		Lf		" . Nervousness
<i>Hexalobus senegalensis</i>	WA	Fl	E	Expectorant. Hair tonic ✓
<i>Hibiscus abelmoschus</i>	WA	Ft	M	Poultice on snakebite -
" <i>ethiopicus</i>	SA	Lf	M	Paste on wounds
" <i>gossypinus</i>	EA	Rt	M	Aphrodisiac
" <i>micranthus</i>	EA	Lf	M	Kidney trouble -
" <i>suranensis</i>	SA	Lf	M	Urinary infection
" <i>trionum</i>	SA	Rt		Roundworm
" <i>sabdariffa</i>	A	Lf	M. D. Hibiscetin	Wounds. Diuretic
<i>Hippobromus alatus</i>	SA	Lf. Rt		Ophthalmia. Colds
<i>Holarrhena africana</i>	WA	Bk	A. Conessine	Fever. Diarrhea. Wounds
" <i>febrifugia</i>	EA	Bk	A. "	Fever. Tonic
" <i>wuyfbergii</i>	WA	Bk	A. "	Fever. Dysentery
<i>Hydnora abyssinica</i>	Ab. EA	Rt	T	Diarrhea. Sore throat
<i>Hymenaea courbaril</i>	M	Bk	T. R. Copal	" . Hemorrhage ✓
<i>Hymenocardia acida</i>	Congo	Lx		" . Dental caries
" <i>lyrata</i>	WA	Lf		Colic. Coughs
<i>Hyoscyamus albus</i>	Na	Lf	A. Hyoscyne, etc.	Topical for pain
<i>Hyposis latifolia</i>	SA	Rt	A. Haemanthine	Purge. Roundworm
" <i>nyatica</i>	EA	Rt	A	Coughs
<i>Hyptis pectinata</i>	WA. M	Lf	E	Roundworm. Fever. Cough
<i>Indigofera arrecta</i>	EA	Rt	D. Indican	Colic
"	SA	Rt		Roundworm
" <i>patens</i>	SA	Rt		Indigestion. Toothache
" <i>pedunculata</i>	M	Lf		Asthma. Nervousness -
" <i>spinescens</i>	SA	Rt		Colic
" <i>zeyheri</i>	SA	Rt		"
<i>Ipomoea crassipes</i>	SA	Rt	R	Dysentery (Enema)

TABLE 14—Continued

<i>Name</i>	<i>Region</i>	<i>Part</i>	<i>Principle</i>	<i>Medical Indications</i>
<i>Ipomea digitata</i>	WA	Rt	R	Purgative
" <i>ficifolia</i>	SA	Lf		Indigestion. Snakebite
" <i>hederacea</i>	TA	Rt. Sd	R. Pharbitisin	Purge. Gonorrhoea.
" <i>involucrata</i>	WA	Lf		Asthma
" <i>ovata</i>	SA	Lf		Coughs
" <i>palmata</i>	SA	Lf		Eruptive fevers
" <i>purpurea</i>	SA	Rt		Purgative
" <i>pilosa</i>	WA	Sd		Purge. On burns
<i>Jasminum auriculatum</i>	EA	Rt	X. Kosotoxin	Snakebite
" <i>floribundum</i>	Ab	Rt	"	Roundworm
<i>Jateorhiza columba</i>	EA	Rt	B. Columbin	Bitter tonic
"	EA	Rt	A. Palmatine	Dysentery
" <i>strigosa</i>	WA	Lf. Ft	A.	Snakebite
" <i>capensis</i>	SA	Lx		Tuberculosis of lungs
" <i>curcas</i>	TA	Lx	P. Curcin	Hemostatic. Wound dressing
"		Sd	P.	Purge. Roundworm. Skin disease
"		Lf		Rubefacient. Rheumatism
" <i>hirsuta</i>	SA	Rt	O. Ricinoleic acid	Purgative
" <i>zeyheri</i>	SA	Rt	O T	Wound dressing
<i>Juniperus phoenicea</i>	NA	Ft	E. Pinene	Alterative
<i>Justicia flava</i>	WA	Rt	A	Bronchitis
" <i>gendarussa</i>	M	Rt. Lf	A	Fever. Yaws. Diarrhea
<i>Khaya senegalensis</i>	TA	Bk	A. Calicedrine	Fever. Cough. Rheumatism
<i>Kigelia abyssinica</i>	NA	Ft	A.	Fever. Malaria. Tonic
" <i>acutifolia</i>	WA	Bk	T	Aphrodisiac
" <i>africana</i>	WA	Ft	T	Dysentery. Ulcer dressing
" <i>ethiopia</i>	EA	Rt		Dysentery. Rheumatism
		Ft		On boils and sore throat
				Purgative

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Rigelia pinnata</i>	CA	Ft		Purgative. Ulcer dressing
<i>Knaziltomia gracilis</i>	SA	Lf	X. Anemonol	Syphilis—
“ <i>rigida</i>	SA	Lf	X. “	Vesicant. Rubefacient
“ <i>transvaalensis</i>	SA	Lf	X. “	Snuff for headache
“ <i>vesicatoria</i>	SA	Lf	X. “	Vesicant. Rubefacient
<i>Lantana alba</i>	WA	Lf	E. A. Lantanine	Fever. Carminative
“ <i>brasiliensis</i>	WA	Lf	E. A. “	Fever. Liver disease
“ <i>camara</i>	WA	Lf	E. A. “	Coughs and Colds
“ <i>rosea</i>	WA	Lf	E. A. “	Fever. Carminative
“ <i>salvifolia</i>	SA, Congo	Lf	E. A. “	Colds. Ophthalmia
<i>Lastiosiphon anthylioides</i>	SA	Rt		Indigestion
“ <i>krassii</i>	SA	Rt	E	Cough. Influenza
“ <i>linifolius</i>	WA	Lf	E	On burns and Snakebite
“ <i>mesmerianus</i>	SA	Rt		Emetic. Purgative
<i>Leea guineense</i>	Congo	Rt		Snuff for headache
“ <i>sambucina</i>	Congo	Lf, Rt		“ . Toothache. Ophthalmia. Snakebite
<i>Leonotis leonotis</i>	SA	Lf, Fl	T	Colic. Gonorrhœa
“ <i>leonurus</i>	SA	Lf, Fl	T	“ . Diarrhea
“ <i>microphylla</i>	SA	Fl	R	Cathartic. Tapeworm. Colds. Snakebite
“ <i>mollis</i>	SA	Fl	R	
“ <i>nepetaefolia</i>	SA	Fl	R	Sores. Hemorrhoids
“ <i>pallida</i>	M. Congo	Rt	R	Purge. Snakebite—
<i>Lichtensteinia pyrethrifolia</i>	WA	Lf	R	“ . Colic. Emmenagogue. Tonic. Malaria
<i>Lippia adoensis</i>	SA	Rt		On syphilitic ulcers
“ <i>asperifolia</i>	WA	Fl	E	Coughs and Colds
“ <i>citriodora</i>	WA	Lf	E	Fever. Colds. Colic
“ <i>scaberrima</i>	SA	Lf	E	Colds. Dysentery. Malaria
			E	Cathartic
			R	Tonic

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Lonchocarpus barkeri</i>	TA	Lf	X. Rotenone	Roundworm. Ophthalmia
" <i>cyaneus</i>	WA	Lf	X. "	Local, Ringworm. Leprosy
" <i>senegalensis</i>	WA	Bk	X. "	Local, Scabies, Herpes
<i>Lophira alata</i>	TA	Bk		Cough. Fever. Jaundice. Indigestion. Leprosy
<i>Luffa cylindrica</i>	WA	Rt		Purgative
" <i>spherosticyos</i>	SA	Rt		Colic. Indigestion
<i>Maesa lanceolata</i>	Ab	Ft	L. Embelic acid	Roundworm
" <i>picta</i>	Ab	Ft	L. "	"
" <i>trichoplebia</i>	M	Ft	L. "	"
<i>Maesopsis emitti</i>	WA	Bk		Purge. Edema. Syphilis
<i>Mahernia botanicaefolia</i>	SA	Lf. Bk		Asthma. Bronchitis
" <i>candicans</i>	SA	Rt		Dysuria
" <i>chrysantha</i>	SA	Rt		Colic. Flatulence
" <i>coccocarpa</i>	SA	Rt		Wound dressing
" <i>depressa</i>	SA	Rt		Colic. Emetic
" <i>micrantha</i>	SA	Rt		Colic. Flatulence
" <i>veronicifolia</i>	SA	Rt		Local on Eczema
<i>Mallotus oppositifolius</i>	WA	Lf. Bk	R. Rottlerin	Tapeworm. Dysentery. Ulcer dressing.
" <i>schimperi</i>	Ab	Bk	R. "	Toothache
<i>Malva parviflora</i>	SA	Lf	M	Tapeworm
" <i>ylvestris</i>	NA	Rt	M	Poultice. Wound dressing. Tapeworm
<i>Marrya spicata</i>	WA	Lf		Coughs
<i>Marrubium subinum</i>	NA	Lf		Emetic. Abortifacient. Snakebite
<i>Melianthus comosus</i>	SA	Rt	E. B. Marrubiin	Cholagogue. Wound dressing
" <i>major</i>	SA	Rt		Local, Wounds. Snakebite
<i>Menabea venenata</i>	M	Rt	G	"
<i>Mesembryanthemum acinaeiforme</i>	SA	Lf. Ft	A. Mesembrine	Purge. Emetic
" <i>edule</i>	SA	Lf. Ft	A. "	Heart and Lung affections
				Sore throat. Dysentery



TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Mesembryanthemum tortuosum</i>	SA	Lf	A. Mesembrine	Colic. Intoxicant
<i>Mezonerium benthianum</i>	WA	Lf	S M	Hookworm. Gonorrhea
<i>Microdesmis puberula</i>	WA	Bk		Burns. Pediculosis
		Lf. Rt		Purge. Counter-irritant
<i>Microglossa oblongifolia</i>	EA	Lf		Toothache
“ <i>volvulitis</i>	WA	Lf		Diarrhea. Roundworm. Cough
<i>Mitania capensis</i>	SA	Lf	R. Guacin	Gonorrhea
“ <i>scandens</i>	TA	Lf	T	Ophthalmia. Wounds. Snakebite
<i>Milletia bussei</i>	TA	Rt		Gonorrhea. Galactogogue
		Lf	S	Pneumonia. Syphilis. Leprosy
“ <i>demeusii</i>	Congo	Lf		Roundworm
“ <i>eritocalyx</i>	EA	Rt		On skin eruptions
“ <i>oblata</i>	EA	Rt		Cystitis
“ <i>sanagana</i>	WA	Lf	S	Roundworm. Indigestion
“ <i>sericea</i>	WA	Bk		Diarrhea
“ <i>versicolor</i>	Congo	Lf		Colic. Epilepsy. Ulcer dressing
<i>Mimosa asperata</i>	TA	Lf	A. Mimosine	Bitter tonic. Diarrhea. Gonorrhea. Blood poisoning
“ <i>pubida</i>	WA	Lf		Topical on guineaworm
<i>Mitragyna africana</i>	WA	Lf	A B	Fever. Gonorrhea. Leprosy. Wounds. Blood poisoning
		Rt	A B	Fever. Colic
		Bk	A B	Fever. Diuretic. Emetic
“ <i>macrophylla</i>	WA. Congo	Lf. Bk	A. Mitragynine	Cough. Malaria. Diuretic
<i>Modoca kirkii</i>	EA	Rt	P. Modeccin	Bronchitis
“ <i>senensis</i>	EA	Rt	P. “	Topical skin lesions
“ <i>venenata</i>	EA	Lf. Wd	P. “	Wounds and Sores
<i>Momordica balsamina</i>	WA	Ft	B. Momordocin	Poultice mass
		Pl		Bitter tonic

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications	
<i>Momordica charantia</i>	Congo	Lf	B. Momordocin	Colic	
"	TA	Sd	"	Roundworm	
"	SA	Rt	"	Roundworm. Earache	
<i>Monodora angolensis</i>	Congo	Sd	B.	Indigestion	
"	Congo	Sd	E	{	
<i>Monsonia biflora</i>	SA	Lf	E T		Condiment. Cathartic. Local on guinea worm
"	SA	Lf. Rt	E T		
"	SA	Lf. Rt	E T		
"	SA	Rt	E		
"	WA	Rt	E		
<i>Morinda citrifolia</i>	TA	{	G. Morindin	Diarrhea. Dysentery. Ulcers of stomach and bowel. Anthrax. Snakebite	
"	WA		Lf	D. Alizarin	Emmenagogue
"	WA		Bk	T	Fever. Malaria. Yellow fever
<i>Moringa pterygosperma</i>	TA. M	Ex	{	Astringent. Ulcers	
		Rt		A. Moringenin	Diarrhea. Dysentery
		Bk		R. Phytosterin	Diuretic. Fever. Asthma
		Rt		F. Oil of Ben	Rubefacient. Diarrhea
		Bk		E	Hysteria. Tonic. Scurvy
<i>Mocochasma multiflorum</i>	EA	Rt	E	Emetic. Coughs	
"	SA	Lf	E	Emetic. Diarrhea. Hemoptysis	
		Rt		Dropsy	
<i>Mucuna flagellipes</i>	TA	Lf	Hairs	Tapeworm	
"	M	Lf	Hairs	"	
"	M	Sd	A (Physostigmine)	Tonic. Aphrodisiac	
<i>Mussaenda afzelli</i>	WA	Bk	T	Astringent	
"	TA. M	Lf		Tonic. On eczema	
"	WA	Lf	T	Thrush	
"	WA	Lf	T	Gonorrhoea	
"	M	Bk	T	Astringent. Malaria	
"	WA	Bk	T	Tapeworm	
<i>Myrianthus arboreus</i>	WA	Lf		Dysentery. On bubos	

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Myristica kombo</i>	WA	Sd	E	Tonic in chronic disease
" <i>madagascariensis</i>	M	Ft	E	Scabies
<i>Myrsine africana</i>	E.A. Ab	Ft	L. Embelic acid	Tapeworm
" <i>rhododendroides</i>	E.A.	Ft	"	"
<i>Nephrodium athamanticum</i>	SA	Rt	L. Pannol, etc.	"
<i>Nerium oleander</i>	NA	Lf	C. Neriin	Scabies
<i>Nepoulidia laevis</i>	WA	Bk	T	Tapeworm. Dysentery. Ophthalmia
<i>Ochna alboserrata</i>	E.A.	Rt	T E	Astringent dressing
" <i>membranacea</i>	SA	Rt	T E	Gangrenous proctitis
<i>Ocotea bullata</i>	SA	Bk	E	Diuretic. Headache
" <i>usambarensis</i>	E.A.	Bk	E	Colic
<i>Odina acida</i>	WA	Bk	MR	{Dysentery. Colic. Scurvy Wounds and Skin disease
"		Lf	MR	
" <i>edulis</i>	E.A. SA	Rt	MR	Dysentery. Diarrhea
" <i>stuhlmannii</i>	E.A.	Lf	MR	On carbuncles
<i>Oldenlandia bojeri</i>	E.A.	Lf	D. Alizarin	Snakebite
" <i>glabra</i>	WA	Rt		Dysentery
" <i>globosa</i>	E.A.	Pl		Hemorrhoids
" <i>johnstoni</i>	E.A.	Lf		Diarrhea
" <i>decumbens</i>	SA	Rt		Lung affections
" <i>lanceifolia</i>	M	Pl		Sedative
" <i>senegalensis</i>	WA	Pl		Roundworm
<i>Oncoba brevipes</i>	WA	Sd	F	Skin lesions
" <i>dentata</i>	WA	Bk	F	"
" <i>echinata</i>	Congo	Bk	F. Chaulmoogrov	" " of leprosy
" <i>spinosa</i>	WA. EA	Lf. Bk		Dysentery. Cystitis
" <i>weltwitschii</i>	WA	Rt		Dental caries
<i>Ophiocaulon cissampeloides</i>	WA	Lf	P. Modeccin	Stops bleeding
" <i>gummifer</i>	WA	Lf. Rt	P.	Fever. Biliousness

TABLE 14—Continued

<i>Name</i>	<i>Region</i>	<i>Part</i>	<i>Principle</i>	<i>Medical Indications</i>
<i>Oryzias borealis</i>	TA	Rt	E	Gonorrhea. Rheumatism
" <i>abyssinica</i>	SA	Bk	T	Orchitis
" <i>tenuifolia</i>	EA	Rt	E	Tonic. Anodyne. Galactagogue
<i>Otholoma natalensis</i>	SA	Rt		Roundworms. Indigestion
<i>Oxalis pes-caprae</i>	Ab	Rt		Tapeworm
" <i>smithiana</i>	SA	Rt		"
<i>Parinarium excelsum</i>	TA	Bk	T	Ulcers. Wounds
" <i>glabrum</i>	WA	Bk		Dysmenorrhea
" <i>macrophyllum</i>	WA	Bk	T	Diarrhea. Toothache
" <i>nalaensis</i>	Congo	Ft		Purgative. Roundworms
<i>Parkia biglobosa</i>	TA	Bk		"
"		Rt. Lf		Fever
"		Ft		Toothache. Headache
<i>Parmelia conspersa</i>	SA	Lichen		Diuretic
<i>Passiflora foetida</i>	WA	Lf. Rt		Snakebite
<i>Paqueta canescens</i>	EA	Bk	T	Emmenagogue. Coughs
<i>Peganum harmala</i>	NA	Pl	A. Harmaline	Sore throat. Headache. Snakebite
"			A. Harmine	{ Purgative. Roundworms
<i>Pelargonium alchemilloides</i>	SA	Lf	E	{ Cough. Fever. Emmenagogue
" <i>antidyentericum</i>	SA	Rt	T	Wounds
" <i>pulverulentum</i>	SA	Rt	T	Gastric and Duodenal Ulcer
" <i>ramosissimum</i>	SA	Lf	E	Dysentery
" <i>reniforme</i>	SA	Lf	E M	Colds
<i>Pellaea calomelanus</i>	SA	Rt	L	Wounds
" <i>hastata</i>	SA	Rt	T	Tapeworm
" <i>involuta</i>	SA	Lf	T	Diarrhea
<i>Peltophorum africanum</i>	SA	Rt. Bk	T	Sore throat. Asthma
<i>Pentactletha etveldiana</i>	Congo	Bk		Colic. Wounds
"				Purgative

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Pentactethra macrophylla</i>	WA	Lx Bk	T	Ophthalmia Ophthalmia. Sores. Diarrhea. Roundworms. Leprosy Roundworms
<i>Pentadesma butyracea</i>	WA	Sd	F R	Cathartic. Colic
<i>Pentanisia ouranogyne</i>	EA	Rt		Fever. Colds. Gonorrhea
" <i>variabilis</i>	SA	Rt		Topical, Skin lesions
<i>Periploca nigrescens</i>	CA	Lx	C. Periplocin	Wounds
<i>Phyllanthus capillaris</i>	Congo	Lf	R. Myrobalanin	Wounds. Diarrhea. Gonorrhea
" <i>casticum</i>	M	Bk	T R	Coughs. Purgative
" <i>engleri</i>	SA	Rt	R. Myrobalanin	Jigger ulcers
" <i>discooides</i>	EA	Lf		Clears yellow eyes
" <i>floribundus</i>	WA	Lx		Ophthalmia. Gonorrhea
" <i>madagascariensis</i>	M	Lf		Diarrhea. Narcotic. Wounds
<i>Phytolacca abyssinica</i>	A	Bk		Wounds
" <i>stricta</i>	SA	Lx	X. Kosotoxin	Tapeworm
<i>Pitralima kleiniana</i>	WA	Ft		Cough. Fever. Diuretic
" <i>nitida</i>	WA	Lf		Purgative. Wounds
<i>Pitosporum viridiflorum</i>	SA	Rt		Purgative. Cough
<i>Plectranthus elegans</i>	WA	Rt	A. Akuammine	Malaria
" <i>hirtus</i>	SA	Sd	A.	Malaria. Fever. Roundworms
<i>Plumbago capensis</i>	EA	Bk	B. Pittosporin	Fever. Emetic
" <i>zeylanica</i>	EA	Lf	E	Sore throat
<i>Plumeria elegans</i>	SA	Lf. Rt	E	Colds
" <i>holstii</i>	SA	Rt	B. Plumbagin	Warts. Snuff
<i>Polygala arnaria</i>	WA	Rt. Lf	B.	Counter-irritant. Vesicant
	EA	Ex	G. Plumerin	Pulmonary hemorrhage
	EA	Ex		Styptic
	WA	Lf		Sores. On smallpox sores

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Polygala hottentota</i>	SA	Rt		Mumps
" <i>micrantha</i>	WA	Rt. Lf		Purge. Diaphoretic
" <i>aphrodisiaca</i>	EA	Rt		Aphrodisiac
" <i>rarifolia</i>	SA	Rt		Indigestion
" <i>serpentaria</i>	SA	Rt		Purge
" <i>oppositifolia</i>	SA	Rt		Dropsy. Scrofula
<i>Psorospermum androsimacifolium</i>	M	Rt. Lf		Topical on Eczema
" <i>febrifugum</i>	EA	Bk. Rt		On Eruptions, Wounds
		Rt. Lx		Purge. Fever
<i>Pterocarpus adansonii</i>	WA	Bk	T	Diarrhea
" <i>angolensis</i>	SA	Ex	T. Kino	Dysentery. Skin affections
" <i>bussel</i>	EA	Bk	T	Abortifacient
" <i>erinaceus</i>	WA	Ex	T. "	Diarrhea. Ulcers
	WA	Bk	T	Astringent. Abortifacient
	WA	Lf	T	Diarrhea
" <i>indicus</i>	WA	Lf	T	Fever
" <i>lucens</i>	CA	Ex	T	Syphilis
" <i>santalinus</i>	WA	Bk	T	Dysentery. Schizostomas
" <i>soyauxii</i>	Congo	Bk. Lf	T	Animal skin parasites
<i>Quassia africana</i>	WA	Wd	B. Quassin	Tonic. Colic. Fever. Worms
<i>Randia acuminata</i>	WA	Rt	S	Pleurisy
" <i>nilotica</i>	WA	Ft	S	Emetic
" <i>vestita</i>	EA	Rt	S	Indigestion. Gonorrhoea
<i>Ramunculus capensis</i>	SA	Lf	X. Anemonol	{ Cough. Purge. Snuff
" <i>pinnatus</i>	SA. EA	Lf	X. "	{ Scabies. Epispastic
" <i>pubescens</i>	SA	Lf	X. "	{ Sore throat. Mumps
<i>Rauwolfia inebrians</i>	EA	Bk	{ A. Rauwolfine	{ Colic. Astringent
		Lx	{ A. Serpentine	{ Intoxicant
" <i>natalensis</i>	SA	Rt. Bk	{ A. Ajmaline	{ Scrofula. Indigestion

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Rauwolfia vomitoria</i>	WA	Bk Rt Lf Lx	{ A. Rauwolfine A. Serpentine A. Ajmaline A. Ophioxylinc D. Rhamnetin	{ Fever. Indigestion. Scabies Tonic. Cathartic Emetic Colic. Diarrhea Colic. Pneumonia Astringent. Skin lesions Dysentery Diarrhea Sores. Scrofula Anodyne Diarrhea. Gonorrhea Rub for Rheumatism Aromatic tonic Purgative Menstrual pain Purgative Hematuria Astringent Colic. Indigestion Diarrhea " Purgative Diarrhea Round and Tapeworm
<i>Rhamnus prinoides</i>	SA. EA	Rt	T	Astringent. Skin lesions
<i>Rhizophora mangle</i>	WA	Bk	T	Dysentery
<i>Rhynchosia adenodes</i>	SA	Rt	T	Diarrhea
" <i>brachypetala</i>	SA	Rt	T	Sores. Scrofula
" <i>caribaea</i>	SA	Lf	T	Anodyne
" <i>sigmodes</i>	SA	Rt	T	Diarrhea. Gonorrhea
<i>Ricinodendron africanus</i>	WA	Sd. Lx	F R	Rub for Rheumatism
<i>Rourea obtusifolia</i>	Congo	Sd.		
" <i>pervilleana</i>	M	Bk		
<i>Royena hirsuta</i>	SA	Bk		
" <i>lucida</i>	SA	Rt		
" <i>pallens</i>	SA	Bk	T	Purgative
" <i>pentandra</i>	SA	Rt		Menstrual pain
<i>Rubus fruticosus</i>	EA	Rt		Purgative
" <i>lutwigi</i>	NA	Rt	T	Hematuria
" <i>pinnatifidus</i>	SA	Rt	T	Astringent
" <i>rigidus</i>	SA	Rt	T	Colic. Indigestion
<i>Rumex abyssinicus</i>	SA	Rt	T	Diarrhea
" <i>ecklonianus</i>	Ab Congo SA	Rt Lf Rt	Q. Chrysophanic acid	Purgative Diarrhea Round and Tapeworm
<i>Salix capensis</i>	A	Twig	Salicin	Rheumatism
<i>Salvadora persica</i>	CA. EA	Bk Rt	A. Trimethylamine	Roundworms. Gastritis Hookworm. Gonorrhea
<i>Salvia africana</i>	SA	Pl	E	Colds

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Salinia repens</i>	SA	Rt	E	Indigestion. Diarrhea
" <i>stymbrifolia</i>	SA	Pl	E	Sore throat
<i>Sansoneria guineensis</i>	WA	Rt		Wounds. Carious teeth
" <i>kirkitii</i>	EA	Rt		Cathartic
" <i>liberica</i>	WA	$\left\{ \begin{array}{l} \text{Rt} \\ \text{Lf} \end{array} \right.$		Tonic
" <i>senegambica</i>	WA			Ulcer dressing
" <i>trifasciata</i>	WA			
" <i>tyrsiflora</i>	SA	Rt		Round and Tapeworm. Hemorrhoids
<i>Sapindus abyssinicus</i>	WA	Lf		Wound dressing
" <i>oblongifolius</i>	SA	Rt	T	Diarrhea. Dysentery
" <i>senegalensis</i>	WA	Bk	T	Astringent
<i>Sarcocephalus diderichii</i>	EA	Rt	S	Coughs
"	WA	Rt	A. Doundakine	Fever. Hematuria
" <i>esculentus</i>	TA	Lf	A B	Fever. Indigestion. Ulcers
"		Rt	A B	Tonic. Fever. Malaria. Eye wash
" <i>pobeguni</i>	WA	Lf	A. Doundakine	Indigestion. Roundworm
<i>Scabiosa columbata</i>	WA	Bk		Emmenagogue. Menorrhagia
<i>Schizoglossum shirensis</i>	SA	Rt		Fever. Malaria. Worms
<i>Sella rigidifolia</i>	EA	Pl		Ophthalmia. Colic
<i>Sclerocarya birroea</i>	SA	Rt		Stomachic. Dysentery
" <i>caffra</i>	WA	Bk		Rheumatism
<i>Scoparia dulcis</i>	SA. EA	Bk		Dysentery
<i>Securidaca longepedunculata</i>	WA	Bk		Dysentery. Proctitis
"	WA	Pl		Indigestion. Gonorrhea
<i>Senecio ambavilla</i>	TA. SA	Rt. Bk	$\left. \begin{array}{l} \text{T S} \\ \text{T} \end{array} \right\}$	$\left\{ \begin{array}{l} \text{Purge. Indigestion. Cough} \\ \text{Tapeworm. Syphilis} \end{array} \right.$
" <i>concolor</i>	M	Lf		
" <i>erechthitoides</i>	SA	Lf		
"	M	Lf		Diuretic. Rheumatism
"	M	Lf		Wound dressing
"	M	Lf		Coughs. Syphilis



TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Senecio latifolius</i>	SA	Lf	A. Seneciifoline	Wound dressing
" <i>serratuloides</i>	SA	Lf		Syphilis
" <i>speciosus</i>	SA	Lf		Dropsy
" <i>stuhlmannii</i>	EA	Lf		Ulcer dressing
" <i>subscandens</i>	EA	Lf		Colic. Fever. Toothache
<i>Serjania curassivica</i>	TA	Rt	T	Bleeding. Earache
		Lf		Fever. Gonorrhea
<i>Sesamum indicum</i>	A	Lf	T. Chlorogenic acid	Cough. Sores
		Sd	F	Malaria. Purge. Emollient
<i>Simaba undulata</i>	WA	Rt. Bk	B. Quassin	Tonic. Fever. Dysentery
<i>Smilax angolensis</i>	WA	Rt	S	Gonorrhea. Rheumatism
" <i>goudotiana</i>	M	Rt	S	Tonic. Stomachic
" <i>kraussiana</i>	SA	Rt	S	Tonic. Diuretic. Fever. Rheumatism. Syphilis.
" <i>mauritanica</i>	WA	Rt	S	Gonorrhea. Ophthalmia
<i>Solanum aculeatissimum</i>	WA	Rt	S	Counterirritant
" <i>adoense</i>	WA	Ft. Rt	A. Solanine	Cough. Dysmenorrhea /
" <i>bojeri</i>	EA	Ft	A.	Wound dressing
" <i>capense</i>	EA	Lf		Ulcer dressing
" <i>incanum</i>	SA	Rt	A.	{ Cough. Diuretic. Cystitis
		Lf	A.	{ Snakebite. Warts. Toothache
	TA. SA	Rt. Lf	A.	{ Cough. Colic. Sore throat
			A.	{ Gonorrhea. Syphilis /
				Cough. Asthma. Hematuria
" <i>macrocarpon</i>	M	Lf		Syphilis -
" <i>melongena</i>	A	Rt	A.	Local anodyne. Dysentery
" <i>nigrum</i>	A	Lf	A.	Fever. Cholagogue. Diuretic
		Lf	A.	Ringworm -
		Ft	A.	Sore mouth /
" <i>panduraciformae</i>	SA	Rt	A.	Local on skin lesions
" <i>pharmacum</i>	EA	Lf	A.	

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Solanum phoricum</i>	EA	Lf	A. Solanine	Local on skin lesions
" <i>sodomense</i>	SA	Lf. Ft	"	Cough. Diuretic. Cystitis
" <i>supinum</i>	SA	Lf. Ft	"	Cough. Diuretic
<i>Solenostemma argel</i>	CA	Lf	X. Cynanchin	Purge. Colic. Fever
<i>Spathodea adenantha</i>	WA	Rt	T	Roundworms. Syphilis
" <i>campanulata</i>	WA	Lf	T	{ Gonorrhea. Dysentery. Proctitis
		Bk	T	{ Ulcers. Leprosy. Syphilis
<i>Spermacoce compacta</i>	EA	Lf	A. Spigeline	Rubefacient
<i>Spigelia anthelmia</i>	WA	Rt. Lf	E. Spilanthol	Roundworms
<i>Spilanthes acmella</i>	TA	Pl	T R	Fever. Pain. Snakebite
<i>Spondias lutea</i>	WA	Bk		Tapeworm. Cough. Wounds
		Lf. Ft		Cathartic. Fever. Yaws
<i>Stephania abyssinica</i>	TA	Lf		Cathartic
		Rt		Roundworms. Menorrhagia
<i>Sterculia appendiculata</i>	EA	Lf	M	Cathartic
" <i>tragacantha</i>	WA	Bk	T	Roundworms
<i>Striga hermonthica</i>	CA	Rt		Leprosy
" <i>senegalensis</i>	WA	Rt		On leprous ulcers
<i>Strophanthus hispidus</i>	WA	Rt	C. Strophanthin	Gonorrhea
		Wd		Wound dressing
" <i>kombé</i>	EA	Rt	C. Strophanthin	Bronchitis
<i>Strychnos dysophylla</i>	SA	Ft	A	Dysentery
" <i>gerrardii</i>	SA	Bk	A	Colic
" <i>henningsi</i>	SA	Bk	A (Curarine)	Round and Tapeworm. Colic
" <i>innocua</i>	WA	Sd		Emetic
" <i>spinosa</i>	A	Rt	A. Strychnine	Snakebite. Fever
<i>Synadenium arborescens</i>	SA	Lf		Catarrh. Toothache

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Synadenium grantii</i>	EA	Rt		Leprosy. Earache
" <i>volkensii</i>	EA	Rt		Malaria
<i>Tabernaemontane iboga</i>	Congo	Rt	A. Ibogaine	Stimulant. Fever
<i>Tacca involucreata</i>	WA	Rt		Rubefacient. Caustic
" <i>pinnatifida</i>	WA	Rt		Rubefacient. Dysentery
<i>Telfaria pedata</i>	EA	Lf		Bitter tonic
<i>Tephrosia kraussiana</i>	SA	Rt	S	Coughs
" <i>macroloba</i>	SA	Rt	S	Fever. Kills vermin
<i>Terminalia avicennoides</i>	WA	Rt	T R	Tonic. Astringent
" <i>chebula</i>	NA	Ft		Cathartic
" <i>macroptera</i>	WA	Lf. Bk	R	Cathartic. Diuretic. Fever
"		Rt		Wound dressing
" <i>sericea</i>	SA	Wd	T	Diarrhea. Dysentery
" <i>splendida</i>	CA	Wd	T	Dysentery
" <i>superba</i>	Congo	Rt	R	Cathartic. Dysentery
		Bk	T	Fever. Gonorrhoea
<i>Tetrapleura thonningsi</i>	WA	Bk	S	Emetic
		Ft		Fever. Gonorrhoea
<i>Tetradidium didymostemon</i>	WA	Lf. Bk		Cathartic. Poulitice
<i>Tournefortia africana</i>	SA	Lf	E	Tonic. Snakebite. Sore throat
" <i>capense</i>	SA	Lf	E	" " Fever
" <i>incanum</i>	SA	Lf	E	" " Sore throat
" <i>polium</i>	NA	Lf	E	Colic
" <i>riparium</i>	SA	Lf	E	Snakebite. Emetic
<i>Thunbergia capensis</i>	SA	Lf	T	Scrofulous sores
<i>Thymus ciliatus</i>	NA	Lf	E. Thymol	Snuff. Earache
" <i>monardi</i>	NA	Lf	E. Thymol	Diuretic

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Tiliacora dinklagei</i>	WA	Lf	A S	Checks bleeding
" <i>gillettii</i>	Congo	Lf	A	Malaria
<i>Tinospora bakis</i>	TA	Lf } Rt }	{ A. Sangaline } { A. Pelosine }	Tonic. Diuretic. Cholagogue
<i>Toddalia aculeata</i>	M	Rt	A. Toddaline	Fever. Gonorrhea
" <i>amanensis</i>	EA	Bk	B. Hesperidin	Tonic. Malaria. Indigestion
" <i>asiatica</i>	EA	Rt		Headache
" <i>nobilis</i>	EA	Rt	B. "	Cough. Influenza
" <i>sansibarensis</i>	EA	Bk	A. Toddaline	Gonorrhea
" <i>simpliicifolia</i>	EA	Rt	E. Citronella	Snakebite
<i>Treculia africana</i>	WA	Lf		Pneumonia
<i>Trema guineensis</i>	TA	Bk		Cathartic. Cough
" <i>orientalis</i>	M	Bk		Local. Leprosy. Guineaworm
<i>Trianthema pentandra</i>	WA	Wd		Cough. Hook- and Roundworm
" <i>salsolooides</i>	CA	Bk		Dysentery
<i>Tribulus terrestris</i>	TA. SA	Rt		Tonic. Fever. Diarrhea
<i>Trichilia emetica</i>	TA. SA	Pl		Gonorrhea
" <i>hendelotii</i>	WA	Bk	T R	Fever
" <i>zimbeki</i>	WA	Rt	T	Diarrhea. Gonorrhea. Gastritis
<i>Trigonella occulta</i>	NA	Bk		Dysentery. Indigestion
" <i>gladiata</i>	NA	Sd		Cathartic. Fever
<i>Triumfetta rhomboidea</i>	SA. M	Rt		Dysentery
" <i>semitriloba</i>	WA	Lf		Heart disease
		Lf		Gonorrhea. Skin lesions
		Bk		Gastritis. Diarrhea
		Sd	A. Trigonelline	Gastritis. Menorrhagia
		Sd	A.	Boils. Ophthalmia
		Rt		Diarrhea
		Lf		

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Tournefortia floribunda</i>	SA	Rt		Emetic. Heart trouble. Rheumatism
" <i>obtusifolia</i>	SA	Rt. Bk		Purge for indigestion
" <i>vogelii</i>	Congo	Lf		Wound dressing
<i>Urginea burkei</i>	SA	Rt	C	Abortifacient. Rubefacient
<i>Urovia afzelli</i>	WA	Bk	T	Infectious jaundice
" <i>chamae</i>	WA	Rt	T	Hematuria. Jaundice
" <i>leptocladon</i>	EA	Rt	T	Epilepsy. Sore throat
" <i>zmleri</i>	SA	Bk		Fever
<i>Vangueria apiculata</i>	EA	Rt		Roundworms
" <i>canthioides</i>	EA	Rt		Local in Yaws
" <i>dalzielii</i>	WA	Lf		Antidote to arrow poison
" <i>emirensis</i>	M	Rt		Astringent, wounds and eyes
" <i>infausta</i>	SA	Rt		Cough. Dysmenorrhea. Roundworms
" <i>madagascariensis</i>	M	Rt		Astringent, wounds and eyes
" <i>neglecta</i>	EA	Lf		Rheumatism. Pleurisy
<i>Vitis erythodes</i>	EA	Rt	T	Wound dressing
<i>Vernonia amygdalina</i>	EA	Lf		Colds. Fever. Headache
" <i>citerea</i>	EA	Rt		Purge. Gonorrhoea
" <i>conferta</i>	WA	Lf. Bk		Local on skin lesions
" <i>hildebrandtii</i>	EA	Lf		Stomachic. Roundworms
" <i>hirsuta</i>	EA	Pl	A	Purge. Colic. Roundworms
" <i>Kraussii</i>	SA	Pl		Diarrhea
" <i>natalense</i>	SA	Bk		Fever. Colic
" <i>nigritiana</i>	WA	Rt	G	Colic
		Rt	G	Fever. Malaria
				Purge. Colic. Dysentery
				Emetic. Coughs

TABLE 14—Continued

Name	Region	Part	Principle	Medical Indications
<i>Vernonia pectoralis</i>	M.	Lf		Coughs. Tonic
" <i>senegalensis</i>	WA	Rt	A	Tonic. Cough. Emetic. Fever
" <i>woodii</i>	SA	Pl		Coughs. Fever
<i>Vinca lancea</i>	M	Lf	A T	Bitter. Astringent. Emetic
" <i>rosea</i>	SA	Lf		Diabetes
<i>Vitex chrysoclada</i>	EA	Lf	G. Vitexin	Ulcer dressing
" <i>cuneata</i>	WA	Lf. Rt		Coughs. Indigestion
<i>Vitis adenocaulis</i>	EA	Rt	T	Topical on boils
" <i>cirrrosa</i>	SA	Rt	T	Astringent
" <i>cuneifolius</i>	SA	Rt		Impotence
" <i>debilis</i>	WA	Lf	T	Topical on bubos
" <i>hildebrandtii</i>	EA	Rt	T	Snakebite
" <i>polyantha</i>	WA	Lf	T	Ophthalmia
" <i>quadrangularis</i>	TA	Lf. Rt	T	Wound dressing. Muscular pain
" <i>stefaniana</i>	EA	Rt		Malaria
<i>Wedelia natalensis</i>	SA	Lf. Rt	T	Cough. Fever. Wounds. Kill vermin
<i>Weinmannia bojeriana</i>	M	Lf. Bk	T	Astringent
" <i>eriocarpa</i>	M	Lf. Bk	T	"
<i>Withania somnifera</i>	SA. EA	Rt		Cough. Asthma. Syphilis. Diarrhea ✓
		Rt		Abortifacient. Proctitis ✓
		Lf	A. Somniferine	Nausea. Rheumatism
		Lf		Anthrax. Ulcer dressing
		Ft		Ringworm ✓
<i>Xanthoxylum capense</i>	SA	Rt		Cough. Toothache. Snakebite
		Bk		Indigestion. Toothache. Scrofula
		Lf		Colic. Snakebite. Roundworm
" <i>macrophyllum</i>	WA	Rt		Cough. Syphilis. Local in pain

TABLE 14—Continued  
Principle

Name	Region	Part	Medical Indications
<i>Xanthoxylum olitorium</i>	EA	Bk, Lf	Fever. Heart trouble. Gonorrhoea
" <i>senegalense</i>	WA	Bk	Difficult labor
		Lf	Tonic. Astringent. Toothache
<i>Ximenea coffra</i>	SA, EA	Lf	Fever
" <i>americana</i>	TA	Lf	Ophthalmia
" <i>antunesii</i>	EA	Rt	Cough. Fever. Wounds
<i>Xylopia monoptala</i>	WA	Lx	Barrenness
" <i>polycarpa</i>	WA	Lx	Coughs
<i>Xymalobium stellata</i>	SA	Lx	Ulcer dressing
" <i>undulatum</i>	SA	Rt	Ulcers. Kills maggots
		Rt	Emetic. Colic. Snakebite
		Rt	Bitter tonic. Dysentery
<i>Zantedeschia ethiopica</i>	SA	Lf	Poultice mass
<i>Zizyphus jujuba</i>	TA	Bk	Bitter. Colic
		Lf	Wound dressing
" <i>lotus</i>	NA	Rt	Cholagogue. Dropsy
		Ft	Diarrhea
" <i>muricata</i>	SA	Rt	Dysentery. Gonorrhoea. Scrofula
		Lf	Rubefacient. Boils. Cough
" <i>zytheriana</i>	CA	Rt	Dysentery

TABLE 15—Continued

Name	Region	Part	Principle	Medical Indications
<i>Aribrosolen polycephalus</i>	SA	Rt	G. Daphnin	Asthma
<i>Asphodelus microcarpus</i>	NA	Ft	Lx	Earache
<i>Aspilia holstii</i>	EA	Rt		Neuralgia. Lumbago
“ <i>latifolia</i>	WA	Lf		Wounds. Bleeding
<i>Aster asper</i>	SA	Rt		Cough. Syphilis. Snakebite
<i>Astrochlaena lachnosperma</i>	CA	Sd		Cough
“ <i>malocaca</i>	EA	Lf		Ophthalmia
<i>Azima tetracantha</i>	EA	Rt. Lf		Snakebite
<i>Baccarea sparsiflora</i>	WA	Bk		Dysentery
<i>Ballota africana</i>	SA	Pl	E	Colds. Colic. Thrush
<i>Banisteria leona</i>	WA	Lf		To kill lice
<i>Baphia pubescens</i>	WA	Bk	E. Santalol	Topical lumbago
<i>Barteria prionitis</i>	Ab	Pl	R	Fever. Cough
<i>Barteria fistulosa</i>	Congo	Bk. Rt		To kill fleas
<i>Begonia sutherlandii</i>	SA	Lf	X. Oxalic acid	Emetic. Expecto- rant
<i>Bersama paullinioides</i>	A	Bk		Cathartic. Roundworms
<i>Blepharospermum zanguebaricum</i>	EA	Rt		Dropsy
<i>Borassus flabellifer</i>	WA	Rt		Bronchitis
<i>Boscia fetida</i>	SA	Pl		Emmenagogue ✓
“ <i>senegalensis</i>	CA	Ft		Ulcer dressing
<i>Bowatea volubilis</i>	SA	Rt	R A	Purgative ?
<i>Bryophyllum crenatum</i>	M	Lf		Fever. Roundworms
“ <i>pinnatum</i>	WA	Rt		Coughs
“ <i>prolififerum</i>	M	Lx		Burns. Ophthalmia. Earache
<i>Bryophyllum sensitivum</i>	M	Lf		Local, Abscess. Rheumatism
<i>Butyrospermum parkii</i>	WA	Bk		Bitter tonic
<i>Cadaba farinosa</i>	WA	Lf	A	Leprosy ✓
<i>Callilepis laureola</i>	SA	Rt	R	Cough. Fever. Dysentery
				Tapeworm



TABLE 15—Continued

Name	Region	Part	Principle	Medical Indications
<i>Calophanes persoonii</i>	SA	Lx		Snakebite
<i>Calpurnia laytiogne</i>	SA			Kills maggots in ulcers
<i>Carpodinus lanceolata</i>	WA	Ft		Local on bubos
" <i>turbenata</i>	WA			Aphrodisiac
<i>Carpolobia alba</i>	SA	Rt		"
<i>Cayaponia globulosus</i>	WA			Purgative
<i>Celastrus buxifolius</i>	SA	Rt	B. Celastrin	Pleurisy
<i>Cephalanthus natalensis</i>	SA	Ft	A	Malaria
<i>Ceratotheca triloba</i>	SA	Pl		Indigestion. Menstrual pain
<i>Cereus oxycornus</i>	SA	Pl		Local on burns
<i>Chaenostoma rotundifolium</i>	SA	Lf	Juice	Ophthalmia
<i>Chaetachme aristata</i>	SA	Rt. Bk		Hemorrhoids. Toothache
<i>Chasmanthera bakis</i>	WA	Rt	A. Berberine	Gonorrhea. Diuretic
" <i>dependens</i>	EA	Rt	"	Diuretic
<i>Chenopodium vulvaria</i>	SA	Lf	T	Bleeding. Sores
<i>Chilanthum oleraceus</i>	SA	Lf		Colds
<i>Chironia baccifera</i>	SA	Pl	B. Erythrotaurin	Purgative. Alterative
<i>Chlorocodon whiteii</i>	SA	Rt	E. Cumarin	Indigestion
<i>Chlorophyllum sternbergianum</i>	SA	Rt		Laxative
<i>Cistanche tinctoria</i>	EA	Rt		Local, Boils. Sore throat
<i>Cleistopholis patens</i>	WA	Lf		Fever
<i>Clitoria ternatea</i>	M	Sd		Emetic. Purg. Diuretic
<i>Cola cordifolia</i>	WA	Sd		Leprosy
<i>Corchorus olitorius</i>	EA	Lf		Tonic
<i>Cordeauxii edulis</i>	EA			"
<i>Cordia ovalis</i>	EA	Bk	A. Caffeine	Leprosy
" <i>quarensis</i>	EA	Rt		Abortifacient
<i>Cotyledon orbiculata</i>	SA	Lf	A. Picrotoxine	Earache. Epilepsy
<i>Courbonia edulis</i>	EA	Rt		Topical to chest, Cough

TABLE 15—Continued

Name	Region	Part	Principle	Medical Indications
<i>Crabbea angustifolia</i>	SA	Rt		Infantile malnutrition
" <i>nana</i>	SA	Pl		Snakebite
<i>Craterispermum laurinum</i>	WA	Bk		Gonorrhea. Yellow-fever
<i>Cynodon dactylon</i>	SA	Pl		Indigestion. On wounds
<i>Cynoglossum lanceolatum</i>	SA	Lf		Cough. Diaphoretic
" <i>pictum</i>	NA	Sd. Lf		Rhinitis. On boils
<i>Cyperus articulatus</i>	EA	Rt		Toothache
" <i>esulentus</i>	SA	Rt		Indigestion
<i>Cyphocarpa zeyhoi</i>	EA			Rheumatism
<i>Delphinium balansae</i>	NA	Pl	A. Delphinine, etc.	Dysuria in Gonorrhoea
<i>Dialium guineense</i>	WA	Bk		Scabies
<i>Dichostemma glaucescens</i>	SA	Bk		Difficult labor
<i>Diosma oppositifolia</i>	SA	Lf	B. Barosmin	Colds. Diuretic
<i>Dombeya rotundifolia</i>	SA	Bk. Wd		Rectal ulcers
		Rt		Colic
<i>Dorstenia convexa</i>	Congo	Lf		Wound dressing
" <i>smayha</i>	WA	Ft		Gonorrhoea. Hematuria
<i>Doryalis zizyphoides</i>	SA	Rt. Bk		Rheumatism
<i>Drymaria cordata</i>	EA	Lf		Headache
<i>Drypetes</i>	WA	Bk		Local Rheumatism
<i>Ecbolium lineareum</i>	NA	Rt		Paralysis. Bronchitis
<i>Echinops amplexicaulis</i>	EA	Rt	M	Local to chest for cough
<i>Eclipta ereta</i>	Congo	Lf		Diarrhea. Local. Ringworm
<i>Elaeitis silvatica</i>	EA	Lf		Wound dressing
<i>Elephantopus scaber</i>	M	Pl		"
<i>Enantia chlorantha</i>	SA	Bk		" . Cough
<i>Entandrophragma angolense</i>	Congo	Bk		Colic
<i>Equisetum ramossissimum</i>	SA	Stem		Diuretic
<i>Eriocephalus umbellulatus</i>	SA	Lf	E	

TABLE 15—Continued

Name	Region	Part	Principle	Medical Indications
<i>Erodium malachoides</i>	NA	Lf	T	Colic. Wound dressing
<i>Erythrocoeca anomala</i>	WA	Lf		Tapeworm
“ <i>africana</i>	WA	Lf		Infantile colic. Purge
“ <i>rigidifolia</i>	EA	Lf		Coughs
<i>Erythroxylum myrtiloides</i>	M	Lf		Indigestion
<i>Ezinga mokusi</i>	WA	Lf		Colic
<i>Eulophia bathiei</i>	WA	Lf		Local throat abscess
“ <i>gracilis</i>	WA	Lf		“
<i>Excoecaria africana</i>	SA	Bk	X. Excoecarin	Purgative
<i>Exomis axyroides</i>	SA	Lf		Epilepsy
<i>Fillacopsis discophora</i>	SA	Bk		Difficult labor
<i>Flagellaria guineensis</i>	EA	Pl		Local, Sores. Skin lesions
<i>Fleurya lanceolata</i>	EA	Juice		Toothache
“ <i>podocarpa</i>	Congo	Lf		Local, Gonorrhea. Ophthalmia
<i>Fuerstia africana</i>	EA	Pl		Malaria
<i>Funtumia elastica</i>	WA	Bk		Jaundice
<i>Gaertnera longifolia</i>	M	Bk	A. Caffeine	Fever
<i>Gazania serrulata</i>	SA	Rt		Toothache. Earache
“ <i>longiscapa</i>	SA	Rt		Purgative
“ <i>pinnata</i>	SA	Rt		Prevents abortion
<i>Geisorrhiza bojeri</i>	M	Lf		Indigestion. Syphilis
<i>Gemista spartioides</i>	NA	Lf		Systemic for boils
<i>Geophylla obovata</i>	WA	Lf		Infantile diarrhea
<i>Gerbera kraussii</i>	SA	Lf		Colic. Roundworms
<i>Graderia scabra</i>	SA	Lf		Indigestion
<i>Grangea maderaspatana</i>	M	Rt		Skin lesions. Proctitis. Typhoid fever
<i>Guarea laurentii</i>	Congo	Lf		Indigestion. Nervousness
“ <i>staudtii</i>	WA	Bk		Cough. Fever. Abortifacient
		Bk. Wd		Gastric ulcer

TABLE 15—Continued

Name	Region	Part	Principle	Medical Indications
<i>Gynema sylvestre</i>	WA	Lf		Snakebite
<i>Gynandropsis pentaphylla</i>	WA	Rt		Astringent
<i>Gynura amplicaulis</i>	WA	Rt		Fever
" <i>cernua</i>	M	Rt		Skin lesions
" <i>crepidioides</i>	EA	Rt	T	Nose-bleed
<i>Hannoa klaineana</i>	WA	Bk		Fever, Colic
" <i>undulata</i>	WA	Lf		Local on Bruises
<i>Haplocarpha scaposa</i>	SA	Rt		Colds, Gonorrhea, Emmenagogue
		Lf		Local to sores
<i>Harpagophytum procumbens</i>	SA	Rt		Purgative, Fever
<i>Hedychium coronarium</i>	M	Rt		Indigestion, Emmenagogue, Aphrodisiac
<i>Helinus ovatus</i>	SA	Rt		Hysteria
<i>Heliotropium indicum</i>	WA	Pl		Head lice
<i>Hernitaria hirsuta</i>	SA	Pl	S. Herniarin	Sore throat
<i>Hippocratea velutina</i>	WA	Sd		Headache, Fever
<i>Honckeya ficifolia</i>	WA	F1		Ringworm
<i>Hoslanata opposita</i>	EA	Rt, Lf		Colic, Snakebite
" <i>verticillata</i>	EA	Rt, Lf		Fever
<i>Hua gaboni</i>	Congo	Bk		Dysentery
<i>Hugonia platyepala</i>	Congo	Lx		Ophthalmia
		Ft		Purgative
<i>Hybophytanium braunianum</i>	WA	Stem		Ringworm, Aphrodisiac
<i>Hymenodictyon parvislorum</i>	EA	Rt		Kidney trouble
		Lf		Ophthalmia
<i>Hypericum ethiopicum</i>	SA	Rt		Kidney trouble
" <i>peplidifolium</i>	EA	Lf		Indigestion
<i>Hypoestes cancellata</i>	CA	Sd		Gonorrhea ✓
<i>Ilex capensis</i>	SA	Lf		Enema for colic
<i>Imperata arundinacea</i>	SA	Rt		Indigestion, Hiccough

TABLE 15—Continued

Name	Region	Part	Principle	Medical Indications
<i>Ipomea kitiuensis</i>	EA	Rt		Gonorrhea ✓
<i>Isoloma sereti</i>	Congo	Rt		Roundworms
<i>Juncus maritimus</i>	NA	Stem		Gonorrhea ✓
<i>Kalanchoe thyrsiflora</i>	SA	Rt	R	Roundworms
<i>Kedrostis africana</i>	NA	Rt	R	Purgative
<i>Laguncularia racemosa</i>	WA	Bk		Dysentery
<i>Landolphia petersiana</i>	EA	Rt. Ft		Colic. Snakebite
<i>Licanthera africana</i>	WA	Lf		Colic
<i>Lasiocorys copensis</i>	SA	Lf	E	Cough. Hemorrhoids
<i>Lecanodiscus cupanioides</i>	WA	Rt		Poultice on Liver abscess
<i>Lepidium capense</i>	SA	Rt	O	Chronic cough
" " <i>sativum</i>	NA	Sd	O	Gonorrhea ✓
" " <i>schinzii</i>	SA	Pl	O	Snuff for headache
<i>Leucadendron concinnum</i>	SA	Lf	X. Salicin	Malaria
<i>Leucas nutans</i>	EA	Lf	E	Ophthalmia ✓
<i>Linociera welwitschii</i>	EA	Bk		Gonorrhea ✓
<i>Lissochilus arenarius</i>	SA	Rt		Impotence. Barrenness ✓
" <i>dilectus</i>	Congo	Rt		Scabies. Skin lesions
<i>Lygodium smithianum</i>	WA	Rt		Diarrhea
<i>Macaranga heterophylla</i>	WA	Lf	T M	Cough. Indigestion. Hematuria
<i>Macrolobium macrophyllum</i>	WA	Bk		Roundworms. Indigestion
		Bk		Large spleen. Pleurisy
		Lf		Difficult labor ✓
		Rt		Infantile malnutrition
		Ex		Skin lesions
<i>Maerua trichophylla</i>	EA	Rt		Astringent
<i>Mammea ebboro</i>	SA	Ex		Abortifacient. Snakebite ✓
<i>Mappia senegalensis</i>	WA	Bk		Rubefacient. Emetic for poison
<i>Maraya spicata</i>	WA	Lf	(Toxic)	
		Lf		Typhoid-fever ✓
<i>Matricaria globifera</i>	SA	Fl	E B	

TABLE 15—Continued

Name	Region	Part	Principle	Medical Indications
<i>Melothria heterophylla</i>	EA	Rt		Diuretic
" <i>maderaspatana</i>	WA	Lf		Laxative
<i>Microlooma sagittatum</i>	SA	Rt		Colic
<i>Micromeria abyssinica</i>	EA	Lf		Fever. Cough
<i>Milibrasdia fallax</i>	EA	Rt		Cough
<i>Mimulopsis violacea</i>	WA	Lf		Gonorrhea
<i>Mitrocarpum scabrum</i>	WA			Leprosy
<i>Mohlana apetala</i>	EA	Pl		Ophthalmia
<i>Mollugo nudicaulis</i>	M	Pl		Bitter tonic. Cough
<i>Musanga smithii</i>	WA	Bk		Emetic. Cough. Roundworms
<i>Myrica kilimandscharica</i>	EA	Rt		Indigestion. Colic
" <i>meyeri-johannis</i>	EA	Rt		"
<i>Myrothamnus flabellifolia</i>	SA	Lf		Cough
<i>Nesaea polyantha</i>	WA	Pl		Ophthalmia
" <i>sagittifolia</i>	SA	Pl		Hematuria
<i>Nothochlaena eckloniana</i>	SA	Lf		Smoked for colds
<i>Nymphaea stellata</i>	WA	Rt		Emollient. Diuretic. Gonorrhea
<i>Obetia laciniata</i>	M	Lf		Wound dressing
" <i>marifolia</i>	M	Lf		"
" <i>pinnatifida</i>	EA	Lf		Toothache. Rat poison
<i>Ongokea klaineana</i>	Congo	Bk		Whooping cough. Difficult labor
<i>Orcodaphne manni</i>	WA	Ft		Dysentery
<i>Osteospermum nervatum</i>	SA			Indigestion
<i>Ostryoderris stuhlmannii</i>	EA	Lf		Cough
<i>Paeonia corallina</i>	EA	Rt		Nervousness
<i>Palisota thyrsoiflora</i>	WA	Lf		Earache
<i>Passerina filiformis</i>	SA	Pl	Juice	Shooting pain
" <i>hirsuta</i>	NA	Lf		Laxative. Poultice abscess
<i>Paeonia hirsuta</i>	WA	Rt		Gonorrhea

TABLE 15—Continued

Name	Region	Part	Principle	Medical Indications
<i>Pavonia zylonica</i>	WA	Rt		Fever
<i>Pedaliium murex</i>	EA	Pl		Gonorrhea
<i>Penaca fucata</i>	A	Ex	M	Wounds and sores
" <i>micronata</i>	A	Ex	M	" "
<i>Pentas purpurea</i>	EA	Rt		Emmenagogue
		Juice		Fever. Pain
<i>Pentopetia androsimifolia</i>	M	Rt		Emetic. Diuretic. Diaphoretic
<i>Peterisia africana</i>	WA	Bk		Chronic bronchitis
<i>Pétiveria alliacea</i>	TA	Rt	O	Toothache
		Lf	O	Diuretic. Diaphoretic. Hysteria
		Lf	O	Edema. Yellow-fever
<i>Petrea zanguibarica</i>	EA	Bk. Rt		Gonorrhea. Hydrocele
<i>Pseudanum arabiaza</i>	EA	Lf		Asthma. Sore throat
" <i>fraxinifolium</i>	WA	Lf		Diuretic
<i>Phaenuron moloneyi</i>	WA	Sd		Loss of appetite
<i>Phaseolus mungo</i>	EA	Sd		Leprosy. Tumors
<i>Phellolophium madagascariense</i>	M	Pl		Indigestion
<i>Phoenix recinata</i>	SA	Rt	T M	Pleurisy
<i>Phrynium beaumontzii</i>	WA	Rt		Tapeworm
<i>Phylloxyton phyllanthoides</i>	M	Lf		Tonic. Fever
<i>Physalis angulata</i>	Congo	Lf		Topical, Scabies. Smallpox
<i>Physedra barteri</i>	WA	Lf		Gonorrhea. Topical syphilis
		Lf		In ear for deafness
<i>Piptodemia africana</i>	Congo			Purge. Abortifacient
<i>Pistacia mutica</i>	NA	Rt	R	Cough in children
<i>Plectospermum africanum</i>	EA	Lx		Lumbago
<i>Plectronia ventosa</i>	SA	Lf	B.	Indigestion. Diarrhea
<i>Poinctana elata</i>	EA	Lf		Snakebite
<i>Pollichia campestris</i>	SA	Pl	E	Vapor for Rheumatism

TABLE 15—Continued

Name	Region	Part	Principle	Medical Indications
<i>Polygonum serrulatum</i>	SA	Lf		Ulcer dressing
<i>Popoovia ferricata</i>	EA	Lf		Snakebite
<i>Portulaca caffra</i>	EA	Rt	M	Headache. Nervousness
<i>Poterrum ancistroides</i>	NA	Rt	T	Diarrhea. Bleeding
<i>Priva leptostachya</i>	SA	Sd	T	Ulcers. Wounds. Ophthalmia
<i>Protea homblei</i>	Congo	Rt		Epilepsy ✓
<i>Pseudoecdestra kotschii</i>	WA	Rt. Lf		Rheumatism
<i>Pseudolachnostylis mabrouniaefolia</i>	EA	Rt		Purgative
<i>Psoralea pinnata</i>	SA	Rt	E	Hysteria
<i>Psychotria pedunculata</i>	WA	Rt	A. Emetine	Roundworms
<i>Pteris dentata</i>	EA	Rt	P (?)	Hookworm
<i>Pteroclastrus rostratus</i>	SA	Rt		Spinal disease
<i>Pterolobium lacrans</i>	EA	Rt. Lf		Fever. Toothache
<i>Pterorhachis zenkeri</i>	SA	Rt		Aphrodisiac
<i>Pycnanthus kombo</i>	Congo	Bk		Cathartic
<i>Pyrenacantha scandens</i>	SA	Rt		Impotence ✓
<i>Raphanea usambarensis</i>	EA	Ft		Laxative
<i>Raensara aromatica</i>	M	Lf		Colic. Fever. Syphilis
<i>Renecalmia africana</i>	Congo	Lf	E	Skin lesions
<i>Rhinacanthus communis</i>	M	Rt. Lf		Topical on skin lesions
<i>Rhus natalensis</i>	EA	Rt	R	Gonorrhea. Influenza. Wounds
<i>Rubia cordifolia</i>	SA	Rt	T	Impotence ✓
“ <i>petiolaris</i>	SA	Rt		Rheumatism. Dysentery
<i>Salacia lewensis</i>	WA	Bk		Wound dressing
<i>Samadera madagascariensis</i>	M	Bk		Tonic. Fever. Dysentery. Wounds
<i>Sapium ellipticum</i>	EA	Stem		Kills maggots in sores
<i>Sarcocaulon burmani</i>	SA	Pl	T	Diarrhea
<i>Sarcostemma viminale</i>	SA, M	Pl		Emetic. Local uterine bleeding
<i>Schinus molle</i>	SA		E	Gonorrhea ✓



TABLE 15—Continued

Name	Region	Part	Principle	Medical Indications
<i>Schottia brachypetala</i>	SA	Rt	T	Diarrhea. Heartburn
<i>Schaea crassulaefolia</i>	SA	Lf	B T	Snakebite
<i>Secamone gerrardi</i>	SA	Rt		Spinal paralysis
<i>Secocarpus anacardium</i>	M	Ft	X. Cardol	Cautic. Vesicant
<i>Senebiera nilotica</i>	CA	Pl		Diarrhea
<i>Sesbania egyptica</i>	WA	Pl		Fever. Guineaworm
<i>Sideroxylon inerme</i>	SA	Lf	T	Emetic
<i>Silene burchellii</i>	SA	Rt	S	Scrofula
<i>Smeathmannia laevigata</i>	WA	Bk		Dysentery
<i>Solenostemon ocyroides</i>	WA	Lf	E	Colic. Infantile convulsions
<i>Sonchus maritimus</i>	NA	Pl		Poultice for abscess
" <i>oleraceus</i>	EA	Rt		Roundworms
<i>Spermacoce compacta</i>	EA	Lf		Rubefacient. Rashes
" <i>natalensis</i>	SA	Lf		Gangrenous proctitis
<i>Sphaeranthus indicus</i>	TA	Pl		Vapor of oil induces sleep
<i>Sporobolus indicus</i>	EA	Pl	E	Wounds. Snakebite, Local
<i>Stachyothyrus tesmannii</i>	SA	Ft		Abortifacient —
<i>Stachys rugosa</i>	SA	Pl	A. Stachydrine	Galactagogue
<i>Stachytarpheta indica</i>	WA			Dysentery
<i>Stepelia dammeri</i>	SA	Stem	Q	Earache
" <i>gigantea</i>	SA	Stem	Q	Hysteria —
<i>Stenocline incana</i>	M	Lf		Aphrodisiac. Emmenagogue. Syphilis
<i>Stereospermum kunthianum</i>	EA	Ft		Cough
<i>Strobilanthus helictus</i>	WA	Lf		Topical in Arthritis
<i>Stylochiton natalense</i>	SA	Rt		Earache
<i>Sutherlandia frutescens</i>	NA	Lf		Tonic. Indigestion. Dysentery
<i>Tachidadenus longifolius</i>	M			Cathartic
<i>Tamarix africana</i>	NA	Lf		Wound dressing
" <i>gallica</i>	NA	Lf		Large spleen

TABLE 15—Continued

Name	Region	Part	Principle	Medical Indications
<i>Tambourissa elliptica</i>	M	Lf		Fever. Gonorrhea
<i>Tecomaria capensis</i>	SA	Bk		Fever. Pneumonia
<i>Tetracera masuiana</i>	Congo	Rt		Syphilis
“ <i>podotricha</i>	Congo	Lf	E	Cathartic. Roundworm. Gonorrhea
<i>Tetradenia fruticosa</i>	M	Lf		Colic. Diarrhea
<i>Tetrasigma magnifica</i>	SA	Bk		Dysentery
<i>Thapsia garganica</i>	NA	Rt		Laxative. Scabies
<i>Thevetia nerifolia</i>	WA	Bk	C. Thevetin	Malaria
<i>Thomandersia laurifolia</i>	Congo	Lf	Juice	Topical, Ulcers. Smallpox
<i>Thomningia sanguinea</i>	Congo	Fungus on root		Gonorrhea
<i>Troglia velutina</i>	WA	Lf		Local anesthesia
“ <i>meyriana</i>	SA	Rt		Bladder pain
<i>Trichodesma africanum</i>	WA	Lf		Diarrhea
<i>Trichlis sacaleuxii</i>	EA	Rt	A T	Roundworms. Gonorrhea
<i>Trimeria alniifolia</i>	SA	Lf		Indigestion
<i>Tripteris naldensis</i>	SA	Lf		Emetic. Fever
<i>Typha capensis</i>	SA	Rt		Emmenagogue. Syphilis
<i>Ursinia abrotanifolia</i>	SA	Lf		Cough
“ <i>tenuifolia</i>	SA	Rt		Cough
<i>Usteria guineensis</i>	WA	Sd		Cough in infants
<i>Vandellia senegalensis</i>	WA	Pl	B	Topical on Acne
<i>Vanilla crenulata</i>	WA	Lf	E	Vapor bath, Dysmenorrhea
<i>Venidium arctoloides</i>	SA	Lf		Indigestion. Ulcer dressing
<i>Vigna catjang</i>	EA	Rt		Snakebite
<i>Vismia leonensis</i>	WA	Bk. Buds	R	Diarrhea. Kills lice
<i>Wahlenbergia banksiana</i>	SA	Rt		Topical, Syphilitic ulcers
<i>Wormskoldia longipedunculata</i>	SA	Pl		Ophthalmia
<i>Zanba gologuensis</i>	EA	Bk		Cough
<i>Zornia bracteata</i>	SA	Pl		Laxative. Diuretic

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