

- "Faunal Survey of North-West Benin" by P. F. Mason. *Nigerian Field*, Vol. IX, p. 79.
African Handbook of Birds by C. W. Mackworth-Praed and Capt. C. H. B. Grant. Series I, Vol. II, p. 667.
"Collecting for a Zoo" by A. C. Russell. *Nigerian Field*, Vol. XIV, p. 16.
"A List of the Birds of Lagos" by F. Sander. *Nigerian Field*, Vol. XXII, p. 60.
"Some Northern Nigerian Birds" by W. Serle. *Ibis* (14), Vol. IV, p. 28.
"The British Cameroons" by W. Serle. *Ibis*, Vol. 92, p. 622.
"Birds of the British Cameroons" by W. Serle. *Ibis*, Vol. 96, p. 72.
"Birds of Eastern Nigeria" by W. Serle. *Ibis*, Vol. 99, pp. 662-663.
"Birds of Sierra Leone" by G. R. Walker. *Ibis* (14), Vol. III, p. 447.

Nigeria's Useful Plants

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With illustrations by the author and from the Federal Information Service of Nigeria

PART II. MEDICINAL PLANTS (I)

A very large part of the treatment given by native doctors, herbalists, and juju men generally, throughout Nigeria, is based on the use of leaves, seeds, roots and bark of local plants, and these are sold in great quantity and variety in local markets to people in search of cures. From the more general standpoint, though drug plants cover only a part of the field of modern pharmacy, that part is an important one, and their study is still essential.

Although in a number of cases the recovery of the patient—if he does recover—may be attributable to his faith or his natural resistance rather than to the herbalist's skill, many of the plants used have real therapeutic value. Important new drugs have been found by studying plants used as cures by primitive people in other parts of the world. For this reason I have included many of the local drug plants in these notes.

Some species described are accepted as drug plants by several Pharmacopoeias. Provided the yield in active constituents in the Nigerian plant is up to a suitable standard—which can be checked by well established methods—it can be cultivated and the corresponding drugs prepared by classical procedures.

Many plants used in Nigeria are also used locally elsewhere : for these the uses given are not all strictly Nigerian but may be based on the use of the same plants in India, Ceylon, Java, French Guinea, Senegal and Ivory Coast.

CHEMICAL CONSTITUENTS OF VEGETABLE DRUGS

Attention is naturally drawn first to those plants which have a very strong action even in small quantities. Some even cause death and are used in Nigeria in ordeal-poisons and in poisoned arrows. These poisons, however, may be useful in very small doses, for instance in stimulating a weak pulse or in relieving spasm of involuntary muscle : whereas in bigger doses they may paralyse the heart or respiratory tract with fatal results.

Such plants often contain alkaloids or glycosides only to be found in tropical countries. These are imported into Europe and America as the constituents have such complex chemical structures as to make them impossible or uneconomical to synthesize.

As shown later, many of these plants have components which act by primarily stimulating the nervous system but may have secondary effects on other organs. The general action is not always obvious because only the result of a secondary action is noticeable.

Other plants are noteworthy for their pronounced taste or odour. Such plants often contain bitter or essential oils which may have medicinal properties.

Apart from these more "spectacular" drugs, some European vegetable drugs with a mild astringent, emollient, antiparasitic, anthelmintic or laxative action have their equivalents among Nigerian plants. Many of them are commonly used in treating ailments such as diarrhoea, colds, etc. These plants usually have constituents which, when applied or ingested, have a local irritant or protective action on skin or mucosa. Some have an antiparasitic or antibacterial effect.

The active constituents from the plants can be extracted in a primitive way with cold water or by making decoctions or tinctures (alcoholic extracts). More scientifically, the plant material, previously ground, can be extracted with appropriate solvents, and the various active components and impurities can then be separated either by using their different solubilities in solvents, or by chromatography, or by other methods.

As the therapeutic action of the plants depends on their chemical constituents and often can be anticipated if the components are known, I have described this action in as far as I could find the information.

Often the same active principles are found in several members of a same genus. I have therefore included in some cases the active constituents of closely related species.

Abbreviations

B.P. :	British Pharmacopoeia.
B.P.C. :	British Pharmaceutical codex.
Ind. P. :	Indian Pharmacopoeia.
Ind. P.C.	Indian Pharmaceutical codex.
I.P. :	International Pharmacopoeia.
P. Helv. :	Swiss Pharmacopoeia.
F.P. :	French Pharmacopoeia.
U.S.N.F. :	United States National Formulary.

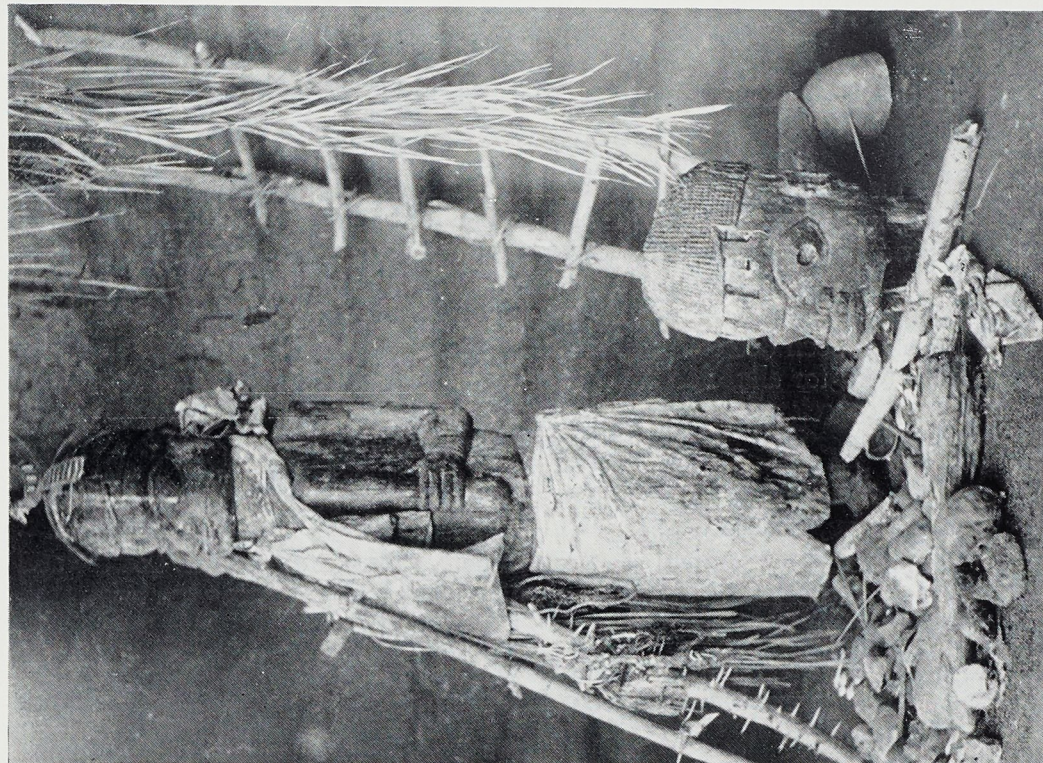
Plants

In. :	Indigenous to Nigeria
C. :	Cultivated plants.
G. :	Experimental or garden plants.

GLOSSARY OF MEDICAL TERMS

Abortifacient	— causing the termination of pregnancy.
Analgesic	— relieving pain.
Anthelmintic	— expelling intestinal worms.
Antibiotic	— naturally occurring substance having in very low concentrations strong inhibiting or lethal action on pathogenic micro-organisms.
Antiparasitic	— destroying parasites like lice, mites, etc.
Antispasmodic	— relieving spasm of smooth muscles (intestines, uterus, etc.)
Antipyretic	— reducing fever.
Astringent	— precipitating proteins.
Auricular fibrillation	— tremor in the heart muscle.
Autonomic nervous system (also called vegetative nervous system)	— That portion of the nervous system which is not centrally controlled. The sympathetic and parasympathetic or vagal-autonomic nervous systems are part of the autonomic nervous system.
Bactericide	— killing bacteria.
Bacteriostatic	— stopping the multiplication of bacteria.
Carminative	— relieving flatulence and aiding digestion.
Cardio-stimulant	— stimulating the heart action.
Carthartic	— producing bowel movements.
Cholagogue	— causing the flow of bile.
Cicatrizant	— favouring the formation of scars.
Counter irritant	— producing superficial congestion and irritation to relieve deep seated pain.

Demulcent	— soothing substance acting by covering and protective properties.
Depilatory	— substance removing hair.
Diaphoretic	— causing sweating.
Diuretic	— increasing the volume of urine produced.
Dysmenorrhoea	— painful menstruation.
Emmenagogue	— regulating menstruation.
Excitant	— stimulating the brain.
Expectorant	— provoking expulsion of the sputum.
Febrifuge	— reducing fever, antipyretic.
Fungistatic	— stopping the development of fungi.
Fungicide	— destroying fungi.
Galactagogue	— increasing the flow of milk.
Haemostatic	— checking bleeding.
Ichthyotoxic	— fish poison.
Myotic	— contracting the pupil.
Mydriatic	— dilating the pupil.
Narcotic	— causing mental stupor.
Pediculosis	— infested with lice.
Rubefacient	— locally irritating.
Sedative	— quieting nervousness.
Spasmolytic	— antispasmodic, checking spasms.
Sternutatory	— causing sneezing.
Stomachic	— stimulating appetite.
Sudorific	— causing sweating
Sympathetic nervous system	— spinal division of the autonomic nervous system controlling involuntary muscles, blood vessels, glands and viscera.
Sympathicolytic	— having an opposite effect on the sympathetic nervous system.
Sympathomimetic	— having an action resembling that produced by the sympathetic nervous system.
Sympathicotonic	— increasing the action of the sympathetic nervous systems.
Taenicide	— killing tapeworms.
Taenifuge	— causing expulsion of tapeworms.
Vasoconstrictor	— producing constriction of the smaller blood vessels.
Vermifuge	— expelling intestinal worms.
Vesicant	— producing blisters.
Vulnerary	— healing wounds.



God of health to whom sacrifice must be made



The doctor on his rounds

SHORT DESCRIPTION OF A SELECTION OF NIGERIAN
MEDICINAL PLANTS

This section gives a series of short notes on individual species and their medicinal uses. Some of these are believed to contain unknown or little known alkaloids or cardiac glycosides, and should be submitted to further chemical analysis and investigation. There are others which appear to have a strong general action, but in which no separate active constituents have yet been detected: these need further research, which might begin with tests for alkaloids and glycosides. Others, again, belong to genera in which related species have known pharmaceutical properties: here, too, further investigation would be worth while.

Abrus precatorius. In.
Crab's eye, Lucky bean.

Papilionaceae.

A climber with small glabrous leaflets, racemes of pinkish flowers and clusters of beans about 1 in. long which burst open, showing the bright red seeds with a black base.

The root, sometimes called false or Indian liquorice, contains about 1.5% of glycyrrhizin, and the leaves up to 9-10% (true liquorice root 5-12%).

The seeds, averaging 1.75 grains, have been used in India, Ghana and Ivory Coast, as standard goldsmith's weights, rati. They contain a toxalbumin, abrin, a severe gastro-intestinal irritant, which agglutinates erythrocytes, causing haemolysis and enlarged lymphatic glands.

Abrin is rendered inactive by boiling, and by the digestive juice. It was locally applied in the treatment of trachoma but has been abandoned as too dangerous as it may even cause blindness. The roots have poisonous properties similar to the seeds.

Acacia polyacantha subsp. *campylacantha.* In.
African catechu tree.

Mimosaceae.

A timber tree up to 80 ft. with large broad-based thorns, cream flowers and brown fruits. It yields a gum included in the Falli gum of Bornu (see gum and resin plants) and the bark is rich in tannins. Locally the people suck the gum or pieces of the bark for sore throat, etc.

Cutch or black catechu is an extract prepared from the heartwood of *Acacia catechu* in India, Java, etc., containing 25-50% of catechu-tannic acid, catechu-red and quercetin and 20-30% of gums and moisture. It is used in medicine as an astringent (diarrhoea) (B.P.C.) and in dyeing and tanning.

In the Nigerian plant, the heartwood appears to be less well developed.

Acacia nilotica var. *adansonii*. In.

Mimosaceae.

The acacia gums and the gum from *Anogeissus schimperi*, form an almost colourless mucilage with water and can be used in pharmacy as emulsifying agents and emollients (B.P.C.). A similar gum is obtained from *Acacia sieberiana* In. An extract of roots and bark of this *sp.* is used locally as a taenifuge, and is rich in tannins.

Acalypha spp. G. and In.

Euphorbiaceae.

An Indian *sp.*, *Acalypha indica*, contains the alkaloid acalyphe. An expectorant and emetic, it is used instead of ipecacuanha (B.P.C., Ind. P.C.). Some Nigerian spp., e.g. *A. ciliata*, are used in local medicine and may have alkaloids.

Adansonia digitata. In.

Baobab. (Described in Vol. XXIII. 4 p. 153)

Bombacaceae.

In local medicine the bark is used as an astringent, diaphoretic and febrifuge, and the pulp and seeds as an antidysenteric. The leaves also find use in the treatment of excessive perspiration, kidney and bladder diseases and asthma: their analysis reveals tannins, catechins and a flavonic pigment: *adansonia* flavonoside. Their mucilage contains galacturonic acid and thamnose. The leaves have hypotensive and antihistamin properties and the leaf-powder has been suggested as an antiasthmatic, but this use could not be confirmed.

Adenium Honghel. In. F.II. Fig. 189.

Apocynaceae.

A shrub of the North with stout smooth stems and branches, half succulent, leafless when in flower: flowers pink or red, rather oleander-like, 1½-2 in. The shrub has the habit of a dwarf baobab.

Seven glucosides, Hongheloside A.B. to G., were isolated from the plant, which acts as a cardiac poison in the same way as digitalin but also affects the central nervous system, the nerve-mechanism of the heart, and even the heart muscle. Locally it is used for poisoning arrows and as a fish poison, and is sometimes applied to bad teeth.

Adhatoda Buchholzii. In.

Acanthaceae.

The plant is used as a fish poison: a related species in India, *Adhatoda vasica*, is also a fish poison, non-lethal to mammals. It contains an alkaloid vasicin and produces bronchial dilatation. Listed in the Indian Pharmacopoeia as an expectorant in chronic bronchitis, asthma and catarrhal infections (also in B.P.C. 1949).

Aegle marmelos. G.

Bael fruit tree.

Rutaceae.

This tree is occasionally grown in Nigeria. The unripe fruit is used as a mild astringent in the treatment of a diarrhoea and dysentery (B.P.C. 1949, Ind. P.C.).

Aframomum melegueta. In.

Guinea grains.

Zingiberaceae.

A 3 ft. high herb with narrow leaves and pink or lilac flower-spike at the base of the leafy stem. The ovate fruits contain golden or red-brown, strongly aromatic and pungent seeds. The taste is due to an essential oil and the pungency to a resinous body, paradol, both contained in the seed-coats. Once used as a spice and medicinally as a vermifuge and stimulating carminative (Ind. P.C.), but now chiefly as a domestic remedy and in veterinary medicine. (Trease).

Locally the seeds of *A. granum paradisi* and the roots of several other *spp.* are given.

Afrormosia laxiflora. In. F.I. Fig. 161.

Papilionaceae.

A tree, 30-40 ft., with red or yellow blotched bark, often tortuous trunk, and pendulous grey pubescent branchlets with greenish white or cream flowers in terminal panicles. The wood is a valuable timber.

Local medicinal use of leaves, bark and roots is based on their analgesic and antipyretic action. The root is said to increase the intoxicating effect of palmwine, and to be also slightly intoxicating if taken by itself. Used in arrow-poisons and in a complex prescription taken to impart strength or moral stimulus "when undertaking a journey or other enterprise".

The leaves contain 0.1% and the rootbark 0.5% of unidentified alkaloids toxic to mice (Kerharo Bouquet). The bark contains catechuic tannins. The allied *Ormosia dasycarpa* and *Afrormosia* or *Orm. coccinea* contain two alkaloids, Ormosin and ormosinine, which have a physiological action similar to that of morphium.

Alchornea cordifolia. In.

Christmas bush.

Euphorbiaceae.

A very common shrub with cordate leaves and red berries. In local medicine the leaves are used in the treatment of eye and other diseases. In America the juice of the berry is used in the preparation of an anti-fouling coating against marine growths on ship-hulls and other metal surfaces. Traces of alkaloids were found in the rootbark, and a bitter principle, alchornine, in the leaves.

Alchornea floribunda. In.

Euphorbiaceae.

A shrub or tree up to 30 ft., with glabrous branchlets. Male flowers in panicles, leaves long and narrow (5-10 in.).

Locally the roots macerated in palm wine are said to stimulate energy and excitement. This seems to be temporary, followed by depression and is considered as harmful as that of *Cannabis*. The roots are also used in the treatment of ophthalmia. An alkaloid was found in this plant by Hamet.

Analysis showed that *Alchornea floribunda* has a sympathicotonic action and increases the sensitivity of the sympathetic nervous system towards adrenaline. In dogs, small doses, 0.15 g. of plant per kg., produce hypotension followed by a slight hypertension. With bigger doses (0.5g/kg.) the blood pressure, after an initial increase, decreases strongly but temporarily ; whilst with still stronger doses the pressure falls regularly and recovers only very gradually. (Caiment-LeBlond.)

Allium sativum. C.

Garlic.

Amaryllidaceae.

Grown in N. Nigeria as a medicine for both human and animal use. The diluted juice of the fresh bulbs is used externally as a mild antiseptic, and the finely chopped cloves added to food act as an effective vermifuge.

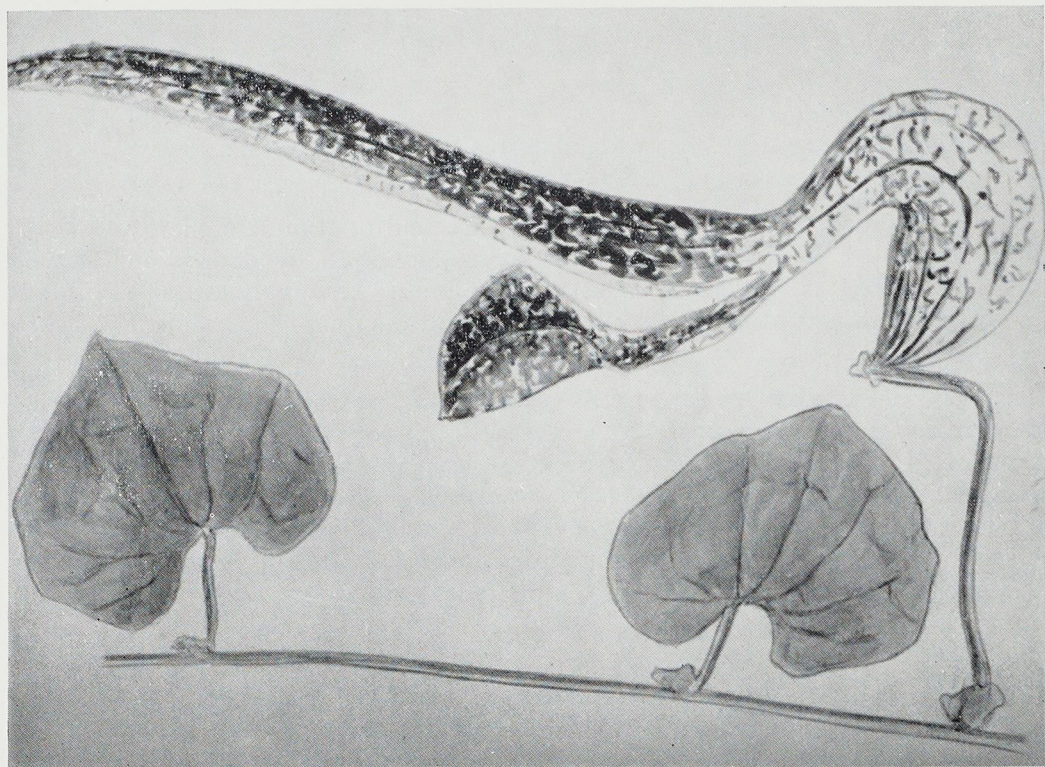
By distillation of the bulbs a volatile oil consisting mainly of allyl-disulphide and allyl-propyl-disulphide is obtained. It is used to diminish cough in chronic bronchitis and as a vermifuge but is irritative. Garlic also contains a glycoside and vitamins B., C. and D. The volatile sulphur oil is used in many vermifugal proprietary medicines.

An antibiotic substance, allicin, which appears to be more bacteriostatic than bactericide has been isolated from the cloves.

Aloe spp. In. F.II. Fig. 297.

Liliaceae.

Stout plants with yellowish-red to bright red flowers and thick succulent leaves. The juice from the cut leaves of W. African *spp.* (referred to as *A. Barteri* but see R. W. J. Keay, *Nigerian Field* July 1957 p. 140) and of *A. vera var. officinalis* and *A. ferox* has a purgative and cooling action. It contains a resin and 10-30% of a pale yellow glycoside "aloin" or "barbaloin". This acts as a drastic purge but should be administered with antispasmodics to moderate its griping action. [B.P. (obs.) B.P.C.] It has also been described as an emmenagogue but produces in longer use congestion and irritation of the pelvic organs.



Aristolochia alba



Abrus precatorius

Alstonia boonei. In.

Apocynaceae.

Tall forest tree with narrow whorled leaves and small greenish white flowers in panicate cymes. The seedpods which occur when the tree is deciduous are very long and narrow. It is the common *sp.* of *Alstonia* in Nigeria and was included in the past under *A. congensis*. The soft light coloured wood is used for light carpentry and for packing cases.

Alstonia congensis. In.

Apocynaceae.

Closely related to the Asiatic *A. scholaris*, perhaps an African variety of that *sp.* The bark contains the alkaloids echitamine and echitamidine. The bark also contains amyryne and lupeol (triterpenes). Locally the bark is used as a febrifuge and externally for rheumatic pains. The latex is smeared on Calabar swellings caused by filaria.

Alstonia bark is used in India as a febrifuge for malaria and as a remedy for chronic diarrhoea. It is said to be inferior to cinchona bark but to leave no after effects such as cinchonism (buzzing in ears).

Andira inermis. In.

Dog almond or Worm bark.

Papilionaceae.

A tree 20-30 ft. high, with pinnate alternate leaves, panicles of pink flowers and pendulous fruits like small mangoes. The seeds are regarded as a good vermifuge in America : in the West Indies the bark is known as worm bark. It is also used to treat psoriasis and ringworm of the scalp. The bark is, however, a dangerous poison in large doses, causing vomiting, with drastic purgation, delirium and narcosis. In N. Nigeria it is an ordeal plant used in the same way as *Erythrophleum*. Alkaloids present are berberine, and angeline or andirine or geoffroyine. In related *A. araroba* which does not occur in Nigeria chrysarobinum is found. (B.P.)

Anona senegalensis. In.

Anona reticulata. C. Custard apple.

Anonaceae.

Small trees with edible fruits. The root of *A. senegalensis* is used in venereal diseases, the rootbark in gastro-intestinal troubles, and an infusion of the leaves serves as an eye lotion. Leaves, bark and roots are used as a vermifuge in horses. The root is said to be of use as an insecticide. Analysis of the powdered root revealed mucilage and tannin. Seeds, bark and leaves of *A. senegalensis* and the fruit and bark of *A. reticulata* contain an alkaloid, anonaine.

Anthocleista nobilis. In.

Cabbage tree.

Loganiaceae.

Tree with opposite obovate leaves, spiny branches and white flowers in stiff branched cymes, corolla tube much longer than calyx. Seeds and bark are used for their antipyretic stomachic and purgative action.

Arachis hypogaea. C.

Ground nut. (Described in Vol. XXIII. 4 p. 163). Papilionaceae.

The fixed oil from the seeds, Arachis oil, is used in oily drugs and plasters and is an ingredient of camphorated oil. (B.P., B.P.C.) The nut also contains a minor alkaloid, arachine (with choline and betaine), which produces transient narcosis in frogs and rabbits with partial paralysis (Henry).

Areca catechu. G.

Areca nut or Betel nut Palm.

Palmae.

Palm 40-50 ft. high, with 6 ft. leaves. The spadix bears male and female flowers. The fruits are 2 in. long, orange or bright red when ripe. Cultivated in Lagos and Southern Nigeria.

Locally the Areca nuts or seeds are used in combination with *Piper* as a masticatory. The nut contains several alkaloids of which the most important is arecoline (0.1-0.5%). Arecaine and guvacine are also found, with others, medicinally unimportant.

In veterinary medicine areca powder is used as a vermifuge for dogs and the hydrobromide for colic in horses. (B.P.C., U.S.N.F., P. Helv.) In human medicine the hydrobromide has been used as a taenicide and myotic, and areca charcoal as an ingredient in the preparation of certain tooth pastes. (Trease.)

Argemone mexicana. C.

Mexican poppy. (Described in Vol. XXIII. 4. p. 168) Papaveraceae.

The seeds yield a yellow oil, which is narcotic and cathartic. The juice and seeds contain the alkaloids berberine and protopine and are used as a sedative and anodyne in cutaneous affections. Protopine is a narcotic.

Berberine acts in small doses as a bitter tonic and in bigger doses it paralyzes the central nervous system. Gupta and Kahali report that berberine inhibits *Leishmania tropica* at 1:80,000 and is effective in the treatment of Oriental sore and of *Trypanosoma equiperdum* in man.

Aristolochia albidia. In.

Aristolochiaceae.

Shrubby climber with racemes of black purple flowers, the older leaves markedly reticulate; fruits about 5-6 cm. long. The root is bitter and in local medicine a cold infusion is taken as a bitter stomachic and tonic. To get rid of Guinea-worm the leaves are applied in a poultice with or without other plants.

Artocarpus heterophyllus. (*A. integrifolia*). C.

Jack fruit.

Moraceae.

Large tree with big edible fruits borne on the trunk or older branches. The roots are used locally as an astringent and antipyretic, and contain a tannin and saponin. The wood yields a dyestuff, morine, and the fruit a triterpenic alcohol, cycloartenol. The tree gives an excellent timber.

Asclepias curassavica. C.

Asclepiadaceae.

West Indian or wild Ipecacuanha. Propagated from seeds.

An erect herb 2 ft. high, with bright orange flowers and seeds with a beautiful silky appendix. A garden plant in Nigeria. The root contains a glycoside and is used in India and the West Indies in decoction and pulverised as an emetic, with similar effects to Ipecacuanha root but more strongly purgative.

An indigenous *sp.*, *A. lineolata* (syn. *Gomphocarpus lineolata*) (F.II. Fig. 196), has thick spindle-shaped roots with white flesh and milky resinous juice. In N. Nigeria a decoction of the roots with native natron is used for gastro-intestinal troubles, and a weak cold infusion is given to new-born infants. In E. Africa the roots are used as a stomachic. They contain starch and some inulin.

Aspilia latifolia. In.

Haemorrhage plant.

Compositae.

The bruised leaves and the flowers are widely used in Nigeria as a haemostatic and to cleanse the surface of wounds by absorbing exudations. In Liberia the plant is said to be extraordinarily effective in stopping bleeding, even from a severed artery, and to induce rapid healing. A decoction is also recommended for pulmonary haemorrhage. The haemostatic action is believed to be due to vaso-constriction. (Dalziel.) In French Africa the plant is used in fumigation to extract filaria.

Azadirachta indica. C.

Neem, Margosa tree.

Meliaceae.

Evergreen tree, up to 80 ft., with panicles of white flowers and yellow fruits. Introduced from India and now naturalised. The oil (margosa oil), is used in India as a hair tonic and in skin diseases. The dried bark is given usually in the form of an infusion or tincture as a bitter and antipyretic. (Ind. P.C.)

Balanites aegyptiaca. In.

Desert date. (Described in Vol. XXIII. 4. p. 164.)

Simarubaceae.

The kernel yields over 40% of a fixed oil (Zachun) oil, used locally

for wound-dressing. The seed cake contains 50% proteins. The root, bark and fruit pulp apparently contain a saponin (7.2% in the fruit pulp) and are lethal to fish, to the freshwater snails which act as hosts for *Bilharzia*, and to the minute free stages of the parasite. 5g. of diosgenin occur per kg. of dried plant.

The unripe fruit and the root have distinctive purgative effects to humans and horses and both are given as a vermifuge, antipyretic and cholagogue.

Baphia pubescens. In.
Benin Camwood.

Papilionaceae.

A shrub or tree of about 20 ft. high with brown-tomentose branchlets and inflorescence; the flowers are sweet scented, white with a yellow streak.

The bark contains an essential oil, santalol, which is used as a disinfectant of the urinary tract and expectorant in bronchitis. Topically it is applied in lumbago. (B.P.C. 1949.)

Baphia nitida. In.
Camwood.

Papilionaceae.

A shrub or small tree with glabrous branchlets and fragrant white flowers with a yellow centre, usually 1-4 flowers together.

The wood is used as a red dye and in local medicine in parasitic skin diseases. In French territories it is used to cure enteritis and other gastro-intestinal complaints. It is also said to be a haemostatic. It contains iso-santalene, santalol derivatives, and homopterocarpine.

Bauhinia rufescens. In.

Caesalpinaceae.

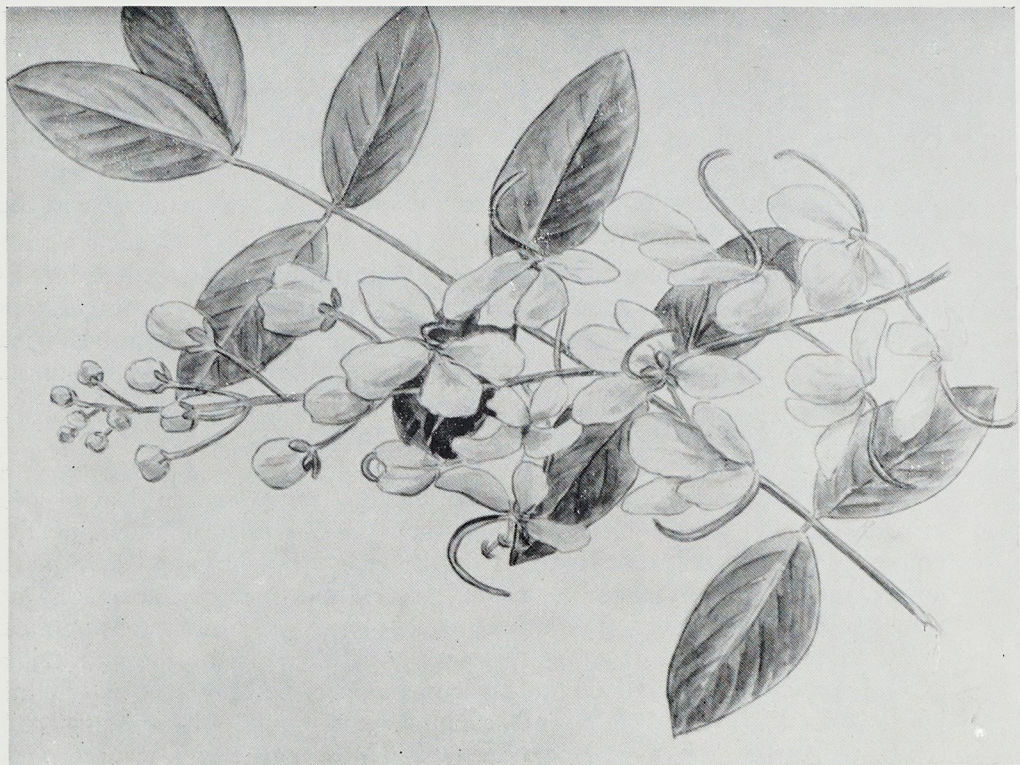
Locally a cold infusion of the bark, rich in tannins, is used as an astringent in wound-dressing and for diarrhoea. The young leaves are used as an expectorant and in the treatment of ophthalmia.

Blighia sapida. In. F.I. Fig. 198.
Akee apple.

Sapindaceae.

A tree 20-50 ft. high with ribbed branchlets, leaves with three to five pairs of elliptic to obovate leaflets, and greenish-white fragrant flowers. The capsular obovoid fruits are brilliant red when ripe and contain black seeds with cupular aril. From the aril a yellow non-drying butter-like fat with peculiar odour and somewhat unpleasant taste is obtained.

The ripe fruit is edible but unripe and decaying akees are poisonous. Hassal has shown that two crystalline polypeptides, isolated from the fruit Hypoglycin A and B, supply these tonic properties.



Cassia fistula



Cassia alata

Both compounds are also present in the seeds whilst in the aril, which is the edible portion of the fruit, only Hypoglycin A is present. Blood sugar levels invariably fall to less than 20% when fatal doses of Hypoglycin A are given, and histological evidence indicates a marked reduction in the concentration of liver glycogen.

The action is of interest in relation to vomiting sickness, as low blood-sugar levels are a characteristic of this condition. Apart from certain active polypeptides in crude ACTH and insulin, no polypeptides with this property are known. They appear to be relatively simple compounds.

Boerhaavia diffusa. In.

Hogweed, Punarnava.

Nyctaginaceae.

A common herbaceous weed with ovate, long-stemmed leaves and crimson flowers in small terminal clusters. Used in local medicine for convulsions, as a mild laxative and febrifuge. The roots and leaves are considered to have expectorant action, are emetic in larger doses and of use in asthma treatment. The thick roots, softened by boiling, are applied externally as a poultice to draw abscesses and to encourage the extraction of Guinea worm. An alkaloid, Punarnavine, can be extracted as well as boerhaavie acid, K. nitrate and tannins, including phlobaphens, and reducing sugars. *B. repens* also contains Punarnavine and is used as a purge, cholagogue and febrifuge.

Borreria verticillata. In.

Rubiaceae.

A glabrous branched more or less woody herb with compact spherical heads of very small white flowers. The roots contain 0.1% of an alkaloid identical with emetin.

Boswellia dalzielii. In. F.I. Fig. 193.
(Also see resin-yielding plants.)

Burseraceae.

Locally bark and root are used for various diseases. The resinous exudate of this tree contains a bitter principle : bassorin. Medicinally the resin is mainly used in fumigating preparations, sometimes in preparing plasters and sometimes as a urinary antiseptic. (B.P.C. 1934.)

Bryophyllum pinnatum.

Resurrection plant.

Crassulaceae.

A tall fleshy plant with opposite leaves and drooping greenish and purple tubular flowers in loose panicles. Naturalised in Nigeria.

The juice is used as a diuretic and for earache and ophthalmia. The diuretic effect may be due to the high potassium malate content. The

juice produces a lather used for shaving the head (saponins?) and also contains ascorbic and other organic acids. The root is used in a cough medicine.

Butea frondosa. C.

Papilionaceae.

Propagated by seeds.

A tree 40-50 ft. high with grey or brown silky pubescent shoots. It has bright orange red flowers with silvery tomentum outside and silvery 6-8 in. long pods with long stalk.

It yields a red gum which was used in Europe and India as a substitute for kino. B.P. 1934. The seeds are used as a vermifuge. B.P.C., Ind. P. The lac insect (*Laccifer lacca*) secreting shellac lives on the sap of this tree.

It also yields a cordage-fibre and a dye.

Caesalpinia bonduc. In. F.I. Fig. 154.

Bonduc or Nicker nut.

Caesalpinaceae.

A common climber with thorny stems and fruits containing several seeds. The seed kernel is chiefly composed of albuminoids (20-22%), starch (35%) and sugar (5-6%). It also contains a bitter principle bonducin or quilandinin (poor man's quinine) and a fatty oil. The bark is said to be a rubefacient and febrifuge, and is used to treat dyspepsia. The boiled leaves provide a gargle for sore throat and the wood was used formerly as a dye, related to haematoxylin.

The phytosterins, sitosterin and ipuranol were also found in this plant. In India (In. P.C.) the dried seeds are reputed to be antipyretic, styptic and tonic (Martindale).

Caloncoba glauca. In.

Flacourtiaceae.

The Ovoid edible fruit of this tree contains an oil consisting mainly of glycerides of chaulmoogric acid. Although, locally, the oil from *Caloncoba* spp. is used for leprosy and pustular skin eruptions, its action in leprosy was not confirmed clinically.

The seeds of the related *C. echinata* (Ghana, in B.P.C. for leprosy) also contain 46% of the same oil, but both contain no hydnocarpic acid, which is now thought to cause the therapeutic action of chaulmoogra oil. This oil has therefore almost entirely been superseded by Hydnocarpus oil.

Calotropis procera. In.

Asclepiadaceae.

Propagated from seeds. (Described in Vol. XXIII. 4. p. 150.)

The dried root bark is used in India instead of ipecacuanha as an emetic, expectorant and diaphoretic (Ind. P.). Its action in amoebic dysentery

treatment seems doubtful. The poisonous latex, used by some tribes as an arrow poison, and locally as a rubefacient, retains its toxicity for a long time even when solid. When applied to the conjunctiva it produces congestion with tears and local anaesthesia followed by general effects due to absorption. Chemically the bark yields a bitter principle (resin) with emetic and cathartic properties, mudarin.

The acid latex contains a cardiotoxic glycoside, calotropin or gigantol, and four other alkaloidal glycosides. Calotropin is a powerful heart poison with an aglycone identical with ouabain, causing death by paralysis of the heart whilst the respiration continues for some time. The four other glycosides are calactin, calotoxin, uscharin and uscharidin. With the exception of calactin they all have the same genine: calotropagenine.

According to Jayaweera the latex as well as the root bark contain β -amyrin. The latex also contains traces of glutathione and a proteoclastic enzyme similar to papain.

Cannabis sativa. C.
Indian hemp, Ganja.

Moraceae.

This plant is the source of a textile fibre, a drying oil and a narcotic drug. It is a stout dioecious annual and has hollow stems and palmate leaves. The narcotic resin is subject to Nigerian Government restrictions.

The common narcotic may come from the dried flowering or fruiting tops or from resin from the shoot. The resin exudes from the surface during growth and is easily collected. "Haschisch" is a rather composite name and refers to a group of preparations made from the drug, e.g., by gently heating it with butter to form an electuary.

It has been used as a sedative and hypnotic in insomnia with pains and in depressive mental conditions. It has a stupefying and hypnotic effect, with hallucinations, agreeable and often erotic dreams and a general state of ecstasy. Its main use to-day is as an analgesic and hypnotic for horses. (B.P.C. 1949, Ind. P.)

Addiction has been common in Eastern countries for centuries and has spread elsewhere in the form of marihuanha cigarettes.

Canthium glabriflorum. (*Plectronia glabriflora.*) F.II. Fig. 211. Rubiaceae.

Small tree with horizontal branches and sickly-scented, small white flowers in dense cymes. A decoction of the bark is used for coughs and in certain mental diseases. The bark contains 1.1% of a crystalline glycoside, calmatambin, which on hydrolysis gives glucose and calmatambetin.

Capsicum annuum. C.

Solanaceae.

Much branched, herbaceous plant up to 2-5 ft., glabrous with white or greenish-white flowers.

The berries are usually deep red and very pungent but much milder than those of *C. frutescens*. They furnish together with these the chillies of commerce. When crushed and powdered the fruits produce the condiment known as cayenne pepper. (B.P.C., U.S.N.F.)

The pungency is due to a volatile phenolic compound, closely related to vanillin capsaicin, which acts as a carminative and counter-irritant. Distributed throughout the plant, it tends to collect in the peduncles and seeds. The milder species contain less capsaicin. The fruits are a valuable source of Vitamin C and also contain Vitamin A and E.

Capsicum frutescens. C.

Solanaceae.

Bird pepper.

Similar to *C. annuum* but with white or pale yellow flowers in clusters of two or more in the leaf axils, instead of singly. The cup-shaped calyx persists in the fruit.

C. frutescens has a longer growing season than *C. annuum*. The fruits are generally smaller, more pungent, and are a much appreciated spice. Locally they are used also as a rubefacient and counter-irritant. (B.P.C., U.S.N.F.)

Carapa procera. In. (Described in Vol. XXIII. 4. p. 160.) Meliaceae.
Crabwood, Monkey kola (also see Oil yielding plants).

Locally the oil from the seeds is used for wound-dressing, smallpox (kundu oil) and as a purgative and anthelmintic. (Moloney.) The bark contains 0.4% of a bitter principle, tulukunin (called "carapin" by some authors) closely related to cail cedrin, 19.5% mineral compounds and 12% tannins. It is used locally as a quinine substitute (antipyretic) and as a bitter tonic. The bitter principle is also found in the seed oil. (H. Moise Mignon.)

Carica papaya. In.

Caricaceae.

Pawpaw.

Small tree with a big crown of palmate shiny leaves at the base of which, in the female trees, clusters of large green closely packed fruits are produced. The milky sap of the unripe fruit yields a proteolytic enzyme, papain, composed of papain and chymopapain. This has the property of coagulating milk and of digesting the fibrous tissues of flesh and acts in both acid and alkaline media at temperatures up to 60°.

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Cryptostegia grandiflora

Papain is commercially produced in Ceylon, British East Africa and the Belgian Congo, but not in Nigeria. The market product is assayed for its proteolytic activity; the sun-dried product is darker and less appreciated than the oven-dried.

Papain is used principally in brewing in a process for chill-proofing beer. Other important uses are in pharmaceutical preparations, as a digestive enzyme (B.P.C., Ind. P.) in chewing gums, and in pre-cooked foods and meat-tenderising preparations. It is also used in textiles (shrinkage resistance and other treatment of woollen and wool-containing materials), and in the rubber industry to season the latex. Two alkaloids, carpain or caricine and pseudocarpain, are isolated from young leaves, and from latex. They have an intensely bitter taste, depress the action of the heart and have been used as a substitute for digitalis in cardiac diseases. The alkaloids also adversely affect the respiration (Henry).

Carpain has anthelmintic properties towards ascarides, trichurides and *Enterobius vermicularis*. (Kerharo Bouquet.) From the seeds Barger Girardet and Robinson isolated small quantities of another alkaloid "carpasemine". Some Japanese investigators attribute a strong amoebicidal action to this principle. The plant also contains myrosine and K-myronate (Perrot).

Carissa edulis. In.

Apocynaceae.

A spiny shrub with cymes of white and red flowers. The root, which is used locally (Ghana) as a tonic, bitter and expectorant, contains a cardiac glycoside carissin. (Githens.)

Cassia absus. In.

Caesalpinaceae.

A weak undershrub 1-2 ft. high, with small red, sometimes yellow flowers with dark veined petals.

The seeds are used as a foment in ophthalmia: they contain a fixed oil and a toxalbumine, absine, similar to abrine from *Abrus precatorius* as well as two alkaloids, chaksine and isochaksine. Chaksine has antibacterial and hypotensive properties: it inhibits the growth of *staphylococcus aureus* at 1:4000 (Skinner) and acts as a stimulant of smooth muscles.

Cassia alata. C. and naturalised.

Ringworm bush.

Caesalpinaceae.

A soft-wooded shrub with big erect racemes of yellow flowers, bipinnate leaves with oval leaflets and pods about 6 in. long with two ridges along the middle.

The leaves have a laxative action. Locally the juice of fresh leaves is used as a remedy for parasitic skin diseases, and in many eruptive and pustular skin affections.

The leaves contain anthraquinones, including 2.2% of chrysorobin which is also present in the fruit pulp. This drug is commonly used as an antiparasitic in "dhobie itch" (crural ringworm) and in the treatment of psoriasis.

Cassia fistula. G.

Caesalpiniaceae.

Glabrous tree, 50 ft., with long pendulous racemes of bright yellow flowers, leaves 1 ft. or more long with four to five pairs of leaflets and long pipe-like pods which do not split. The bark in young trees is smooth and ash-coloured.

The fruit pulp is used as a purgative, the root as a laxative, tonic and febrifuge. The powdered seeds are also prescribed as an emetic. A dark yellow volatile oil containing normal butyric acid is yielded by steam-distilling the finely powdered fruit.

(To be continued)

Note: A full list of authorities and references will be printed in a future issue.—Ed.

Vol. XXIII No. 4: addenda and corrigenda.

Article *Nigeria's Useful Plants.*

Page 150. After *Funtumia elastica*. In. add F.II. Fig. 192.

do. *Cochlospermum* . . . In. add F.I. Fig. 70.

160 do. *Allanblackia* . . . In. add F.I. Fig. III.

do. *Pentadesma butyracea*. In. add F.I. Fig. 112.

164 Line 23. For alkaline "paucine" read alkaloid "paucine".

169 After *Ricinodendron heudelotti*, add F.I. Fig. 137.

171 Add to the Check List (2) the following species:

Carapa procera.

Mimusops djave.