MATERIA MEDICA

OF

MADRAS.

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BY

MOHIDEEN SHERIFF KHAN BAHADUR,

Graduate of the Madras Medical College;

Retired Honorary Surgeon, Madras Medical Department.

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VOLUME I.

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PREFACE.

BEING appointed as a member of the Madras Working Committee, Calcutta International Exhibition, 1883-84, I was very anxious to make myself as useful as possible, and therefore applied for permission to send in a collection of indigenous drugs from this Presidency to the Exhibition. The acceptance of this offer was accompanied with a kind grant of Rs. 200 from Calcutta, as a pecuniary assistance to my undertaking. The drugs I forwarded were nearly one thousand (954), and this work was originally intended to be their Descriptive Catalogue. At the kind recommendation of the above Committee, the Madras Government, with their usual benevolence and liberality, ordered the publication of the Catalogue at their own cost, and I was accordingly directed to get the work printed at the Government Press. The following is the G.O. on the subject :—

PUBLIC DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following—

From the Vice-President and Secretary, Madras Committee, Calcutta Exhibition, dated 7th March 1884, No. 65, C.E.

ORDER THEREON, 21st March 1884, No. 577 Mis.

With reference to para. 5 of Dr. Bidie's letter read above, the Government will be prepared to bear the cost of publishing the very valuable catalogue which Dr. Mohideen Sheriff is now engaged in preparing.

(True Extract.)

(Signed) FORSTER WEBSTER,
Chief Secretary.

To the Vice-President and Secretary,
Madras Committee, Calcutta Exhibition.

No. 282, C.E.

True copy forwarded to Dr. Mohideen Sheriff for information.

(Signed) G. BIDIE, Brig.-Surgeon,
Vice-President and Secretary,
Madras Committee,
Calcutta International Exhibition, 1883.

GOVT. CENTRAL MUSEUM,
24*th March* 1884.

When a portion of this book was printed, I was advised to alter the designation of the Catalogue into that of *Materia Medica of Madras*, and received the following orders with a copy of a despatch from the Government of India :—

PUBLIC DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following paper—

From the Under Secretary to the Government of India, dated 7th January 1888, No. 13-8-1 G.

As it is believed that Dr. Mohideen Sheriff is publishing a new work entitled *Materia Medica of Madras*, the first portion of which has already been struck off, I am directed to request that, pending the final orders of His Excellency the Governor in Council concerning the distribution of the work, you will be good enough, if there be no objection, to cause the Revenue and Agricultural Department to be supplied with 3 copies of pages 1 to 104 and with copies of all subsequent pages as the work passes through the press.

2. The Government of India is desirous to receive these pages at as early a date as possible to enable Dr. Watt, the Reporter on Economic Products, who is compiling a Dictionary on the Economic Products of India under the orders of this department to utilize the very useful information Dr. Mohideen Sheriff is placing before the public regarding the drugs of Southern India.

ORDER THEREON, 1st February 1888, No. 118.

Communicated to the Surgeon-General with Government who will arrange with Dr. Mohideen Sheriff for compliance with the request made by the Government of India. The copies should be forwarded to the Chief Secretary's office for transmission.

(True Extract.)

(Signed) W. S. MEYER,
Assistant Secretary.

No. 586.

(MEMORANDUM.)

Forwarded to Honorary Surgeon Mohideen Sheriff Khan Bahadur, for favour of compliance.

The copies should be forwarded to this office for transmission to Government.

(By order.)

FORT ST. GEORGE,
2nd Feb. 1888.

(Signed) C. M. THOMPSON, Surgeon,
Secy., Surgeon-Genl. with Govt. of Madras.

In obedience to the above orders 16 forms of this Materia Medica were forwarded to Calcutta (in triplicate) through the office of the head of my department, and soon after this the book came to a stand-still, owing to my retirement from the service, as I shall explain presently.

As the medicinal properties of the drugs mentioned in this book are solely from my own experience and knowledge, and not gleaned or borrowed from any other work, English or Native, the greatest thing I was in need of in writing it, was the trial of those drugs in various diseases. I was amply supplied with this need by my being attached to the Triplicane Dispensary, where I had every morning to prescribe for about 100 out-patients, and was thus enabled to select some cases every day for trial. This was the chief resource I depended upon in writing a book of this nature, and its deprivation in consequence of my retirement from the service on the 7th July 1889 is very deplorable and a death-blow to my undertaking.

The delay of six or seven years in writing this book might appear to be great or unusual at first sight, but it is not really so when we consider that it is chiefly based upon actual trials of drugs, as I have just explained. In the first place, the physiological actions and therapeutic uses of medicines being the most important and essential points in a Materia Medica, I did not, as a rule, express my opinion on those properties before I had previously employed the drugs for a long time or on a sufficiently large number of patients; secondly, all the diseases in which it is desirable to try drugs do not occur always, nor whenever we want them, but we must wait with patience and seize the opportunity of their occurrence to carry out the trial of that drug. Beside, the nature of some diseases is such that I was unable to form any

opinion as to the efficacy or otherwise of the drugs tried in them until the trial of each was continued for a few years, at least. Epilepsy and Hysteria are examples of such diseases, whose fits do not always occur frequently, but generally at the long intervals of months and years.

Another circumstance which added to this delay was my own health, which was somewhat impaired after I commenced to write this work, and I was laid up twice with paralysis during its progress.

It is true that my retirement from the service leaves more time at my disposal than before, but it will be clear from the nature of this work that I have been in much greater need of patients for trial of drugs than mere time for writing it.

Being thus unable to go on further with this Materia Medica, it is certainly very painful to me to see the work, in the preparation of which I worked so hard for several years and spared no time or money, and which was also expected to be a permanent monument of my professional labours and researches, terminated so abruptly and abortively. There is, however, no other alternative, and it is quite beyond my power to attempt to complete it.

I brought these unavoidable circumstances to the notice of Dr. W. F. deFabeck, the present Surgeon-General with the Government of Madras, with a request to be permitted to publish the pages already printed, which are about one-third of the book, as its first volume. At his kind recommendation, the Government have graciously pleased to grant my wishes and issue the necessary orders to the Superintendent of the Government Press for the publication of Volume I of the *Materia Medica of Madras* (*vide* G.O., No. 194, dated 10th March 1891).

With a view to make this book correspond as much as possible with the *Pharmacopœia of India*, I have followed the arrangement of drugs adopted in the latter work. They are first divided into three groups in accordance with the number of the Natural Kingdoms, and then the vegetable articles, which are by far the largest in their number, are not arranged alphabetically, but according to the natural orders of the plants producing them. The medicinal products of each plant, with their preparations, &c., are also placed under the same plants. The advantage of this simple arrangement is that all the plants belonging to a natural order are treated together with their respective products, &c., under that order only, and there is no need to look for them,

or for anything else connected with them, in any other part of the work.

Of the drugs included in this work, those that are distinguished by an asterisk (*) are official in the *Pharmacopœia of India*; those by a dagger (†) are non-official in the same work; those by a double dagger (‡) are new drugs introduced by myself; and those by a paragraph (¶) are English or foreign drugs now cultivated on the Nílgiris.

The numbers of articles in this work correspond with those of the drugs I forwarded to the Calcutta International Exhibition, 1883-84, but there are many medicines to which no numbers are prefixed. Though the latter form no part of my collection sent to Calcutta, yet they were found so useful in my subsequent experience and trials that I thought it very necessary to include them in my Materia Medica, but have given them no numbers by way of distinction. According to this arrangement, the last number in the book (221) is much less than the total number of drugs which are actually treated in it.

The method of transliteration used in this work for expressing the vernacular synonyms in English character is the same which was adopted in my *Supplement to the Pharmacopœia of India*, pages 287 to 322. The diacritical marks in this method are only three and of the simplest kind, viz., *accents*, *dots* and an *alteration of type*. The *accents* are employed for the long vowels to distinguish them from the short. The *dots* are either above or below the letters, and in a number varying from *one* to *three*, and thus a letter in English is made to represent more than two or three alphabets in native languages. By *alteration of type* is meant that when two or more English letters are required to represent a single native character in any word, they should be distinguished by Italics if other letters in the same word are printed in the Roman or English and *vice versâ*. The letters in the altered type are to show that they stand together for one native character and require to be pronounced simultaneously.

I was just beginning to write upon the leguminous plants when the preparation of this work received a check, and though it was very desirable to finish, at least, the plants in the natural order of Leguminosæ, I much regret to say that I was unable to accomplish even this, for the reasons already explained.

In conclusion I beg to state that I shall ever feel grateful to the Government of Madras for their generosity in ordering the publication of this work at their own cost, and am very thankful to the Madras Working Committee, Calcutta International Exhibition, 1883-84, for their kind recommendation to the above effect.

I owe my best thanks to Dr. G. Bidie, M.B. and C.I.E., the late Surgeon-General with the Government of Madras, for his kindness in many respects. The fact of his being the Vice-President and Secretary to the above Committee, in addition to his charge of the Government Central Museum in Madras, was greatly to my own advantage, and it was through his kindness I had an access not only to all the books in the Museum, but also to every article necessary for packing and despatching my collection of drugs to Calcutta. I am also much indebted to Dr. W. F. deFabeck, the present Surgeon-General with the Government of Madras, for his kindness in recommending the publication of this volume to Government.

I am very thankful to Mr. W. F. Dique and T. Abboy Naidoo, the Curator and the Herbarium-keeper, respectively, in the Government Central Museum, for their kind assistance in packing and despatching the above collection. I must express my thanks again to Abboy Naidoo for his kind and great assistance in preparing almost all the indices in this book.

It now remains for me to say that I am very thankful to the Superintendent and other officers of the Government Press, who were always kind and willing, and did all in their power to expedite the work, though its progress was often disturbed.

MOHIDEEN SHERIFF KHAN BAHADUR.

MADRAS,
January 1891.

NOTE.

Owing to the death of Dr. Mohideen Sheriff on the 21st February 1891, the Government of Madras has accepted with pleasure the offer of Mr. David Hooper, Government Quinologist, Ootacamund, to edit and complete the *Materia Medica of Madras* (G.O., No. 371, dated 9th May 1891, Public Department).

CONTENTS.

MATERIA MEDICA OF MADRAS.

VEGETABLE KINGDOM.

RANUNCULACEÆ.

*** Aconitum ferox, *Wall.* 1, 2, 3 and 4.**

Habitat.—Himalayas.

Part Used.—The root.

Synonyms.—Indian aconite root, *Eng.* Racine d'aconite d'Inde, *Fr.* Bachnág, *Duk.* and *Hind.* Vasha-návi, *Tam.* Vasanábhi, *Tel.* Bísh, *Arab.* and *Beng.* Bísh-nág, *Pers.* Valsanábhi, *Malyal.* Vasanábhi, *Can.* Vachnág, *Guz.* Vachanábhi, *Cing.*

Local Sources.—Met with in every large bazaar of India.

Price.—Wholesale, Rs. 6 per maund; retail or bazaar, As. 12 per pound.

Physiological Action.—The white and the reddish-brown varieties of the Indian aconite root, which I shall describe presently, can be used internally. They are a good nervine and alterative tonic and sedative in medicinal doses, but a very virulent poison in larger ones. The former is somewhat milder and more uniform in its action than the latter. The activity of aconite root is due to a mixture of alkaloids, the chief of which is *aconitine*.

Therapeutic Uses.—Very useful in diabetes mellitus and insipidus, spermatorrhœa, incontinence of urine, paralysis, and some neuralgic affections; also, to a less extent, in leprosy and some other skin diseases.

Preparations.—They are best used in the form of powder with some inert or farinaceous substance as follows:—

Take of the white variety of the Indian aconite root in powder one ounce, arrowroot or wheat flour seven ounces. Mix them thoroughly, pass the powder through a fine sieve, rub it lightly in a mortar, and keep it in a bottle. The powder of the reddish-brown variety is to be prepared in precisely the same manner as the above. The roots can also be employed in the form of tincture, but the powders I have just described were so cheap and convenient, and proved so useful that I did not think it necessary to resort to any other form.

Dose.—Of the powder of the white variety, from two to eight grains, gradually increased, three times in the twenty-four hours; the average and usual dose being four grains. Of the powder of the reddish-brown variety, from two to six grains, gradually increased, three times in the twenty-four hours; the average and usual dose being three grains. Eight grains of each powder contain one grain of the

root. Giddiness, headache and dryness or uneasiness in the throat are the first symptoms of the bad or poisonous effect of this root, and from idiosyncrasy some patients are apt to feel them in pretty small doses. Whenever they are felt in the smallest degree, the drug should be stopped at once for a day or two, and if it is necessary to use it again after that period, it should be done only in half of its previous dose.

European Drugs for which it may be substituted.—For all European medicines, which are generally employed in diabetes, spermatorrhœa, and incontinence of urine, and for strychnine and the European aconite root.

Remarks.—There is no other drug whose varieties are so numerous as those of the *Bish* or *Bachnág* of the bazaar. Some well-known native medical works describe no less than eighteen varieties of it. Most of these, however, do not find their way into the bazaars of Southern India, and I myself did not see more than seven or eight, including those that had been obtained from distant places. As all the varieties I have seen are known to grow on the Himalayan Mountains, and bear a great resemblance to each other, there is no doubt that they are aconite roots, but, at the same time, there is a sufficient dissimilarity between most of them to justify the opinion that they are not the produce of one and the same plant. They are apparently the roots of several species of *Aconitum*; including *Aconitum ferox*. When many of these roots are examined together, the first difference which attracts our attention is their size, which is generally very large in some and very small in others, and they may therefore be divided primarily into the *larger* and *smaller* kinds. The larger kind consists of five or six varieties, the principal of which are the *white* (suféd-bachnág), the *reddish-brown* (lál-bachnág), the *black* (kálá-bachnág), and the *sweet* (mítházahar). The **Nos.** of these varieties are **1, 2, 3** and **4,** respectively, in my Collection of Drugs forwarded to the Calcutta International Exhibition, 1883-84.

(a) The white variety **(No. 1)** is a tuberous root, more or less conical, varying in length from 2 to 4 inches, and in thickness at its base from ½ to 1½ inches, depressed or flattened irregularly, and wrinkled chiefly in a longitudinal direction. It is deep brown externally, pale or dull white internally, very hard, inodorous, and, on chewing, its taste is slightly bitter at first, but is followed after a minute or two by a more or less acrid and tingling sensation on the tongue, which lasts from some minutes to several hours. When this root is broken into pieces, it will not always be found of pure white color, but a portion of it is often grey or reddish-brown, and the fracture in that portion is resinous, waxy or shining, but in all other parts, rough and irregular. The broken parts and prominent portions of most of the Indian aconite roots are more or less whitened by friction, which leads to the supposition of their being white varieties. It is generally the reverse, and therefore their external appearance is not a correct indication of their internal condition. In selecting for internal administration, no root should be considered as a white variety, until it is examined by breaking or cutting. The *suféd-bachnág* is neither imported nor sold separately, but is picked out from the reddish-brown variety whenever it is required. It is not half as cheap and abundant as the last-named variety, but I have spoken of it first on account of its greater value as

a therapeutic agent. It is, however, much cheaper and more common than all other varieties.

A few years ago I took the white variety of *Bachnág* myself in small quantities, and found that its internal use is not attended with more danger than that of the European aconite root (*Aconitum Napellus*). Since that period I have employed it very extensively in my practice, and do not hesitate in saying that it is one of the most useful medicines in India. Its beneficial influence over diabetes is very remarkable, the immoderate flow of urine beginning to diminish from the very day of its use with a proportionate decrease in the saccharine matter. Its control over spermatorrhœa and incontinence of urine is equally great. It has lately been found useful in some cases of paralysis and leprosy. The advantages of this drug over all other varieties of the Indian aconite root are that it is not only much milder, but also more certain and uniform in its actions. The *white* and *hard* variety, which I am speaking of, and which has just been described, is quite different from the *white* and *spongy* variety mentioned in some books.

(*b*) The reddish-brown variety of the Indian aconite root **(No. 2)** is the cheapest and most common, and is generally imported to Madras from Calcutta. The price marked in the text is applicable to this variety alone. It does not differ from the white variety in any respect, except in its strength and internal color. It is stronger in its action and taste, and I think contains more *aconitine*. The color of its internal substance is generally reddish-brown, but sometimes deep grey or yellowish-brown. I have also used this root very extensively, and with almost the same results. Its doses are smaller as already explained. In consequence of the reddish hue of its internal substance, it is often known in the bazaars of Madras as the *red* aconite root, as follows :—

Lál-bachnág, *Duk.* Sen-nábhi or Shivappu-nábhi, *Tam.* Erra-nábhi, *Tel.*

(*c*) The *Kálá-bachnág* or black aconite root **(No. 3)** is dark-brown externally, and shining black and horny internally. When it is very dry and hard in the hot weather, it breaks with a shining fracture, but the fracture is very rough and resinous in the wet and cold seasons. The roots in this variety are generally smaller, thinner, and smoother ; and some of them bear a great resemblance to a horn of a deer or goat. The latter are, therefore, called the *sînghyá-bis* or *horny* aconite root. The black variety is very rare and dear, and is not to be found at present in Madras. The five roots of this variety in my Collection are from Hyderabad, and their price is Rs. 2.

(*d*) The *Mīṭhá-zahar* or sweet aconite root is the dearest and rarest of all the large varieties of *Bachnág*. The only root of this variety **(No. 4)** I was able to procure for the Collection is from Calcutta, and its price is As. 8. I received it, however, under the name of *Suféd-bachnág*, but on cutting and examining a small portion of it, I found it to be a very good specimen of *Mīṭhá-zahar*. The whiteness of the prominent portions of this root seems to have given rise to the above mistake, as it does often, as already explained under the white variety (*a*). The root under consideration (Mīṭhá-zahar) is generally more shrunken, shrivelled, and depressed irregularly ; and is somewhat soft

and cuts easily. It is brown internally, and, as its name implies, is slightly but distinctly sweet instead of bitter. The sweetness makes no difference in the tingling and other sensations, which are so peculiar to all aconite roots.

With regard to the *smaller* kind of aconite roots, they are those whose length is invariably below one inch and a half. They may be sub-divided into the *poisonous* and *non-poisonous* varieties. The *poisonous* are distinguished by the acridity and tingling sensation of their taste, and still retain the name of *Bīsh* or *Bachnág*. Such small varieties of *Bīsh* are said to exist in some parts of Upper India, but I never saw any of them here. All other smaller roots are, with the exception of the root of *Aconitum ferox* **(Nos. 5, 6 and 7)**, the *non-poisonous* varieties, well-known in India and many other parts of Asia under the Arabic name of *Jadvár*. (*See* **Nos. 9 and 10**).

* Aconitum heterophyllum, *Wall.* 5, 6 and 7.

Habitat.—Himalayas.

Part Used.—The root.

Synonyms.—Viláyatí-vajje-turkí, *Duk.* Atís, *Hind.* Shímai-ativadayam, *Tam.* Síma-ati-vasa, *Tel.*

Local Sources.—Sold in many large bazaars of India.

Price.—Wholesale, Rs. 70 per maund; retail or bazaar, Rs. $1\frac{1}{4}$ per pound.

Physiological Actions.—Antiperiodic, antipyretic, and tonic.

Active Principle.—An alkaloid of intensely bitter taste, discovered by Mr. Broughton, and named *atisine*.

Therapeutic Uses.—Useful in intermittent and simple continued fevers, and in some forms of dyspepsia and debility.

Preparations.—Simple powder.

Dose.—As an antiperiodic, from one to two drachms; as an antipyretic, from forty grains to a drachm and a half; and as a tonic, from ten to thirty grains.

European Drugs for which it may be substituted.—For the alkaloids of cinchona as an antiperiodic; for Pulv. Jacobi vera, Pulv. antimon. and Liq. ammon. acet., as an antipyretic; and for gentian and calumba, as a tonic.

Remarks.—This drug occurs in the bazaars of Madras under the Persian name of *Vajje-turkī* from time immemorial, but was not known as the root of *A. heterophyllum* until about 14 years ago. In 1869, while engaged in examining the bazaar medicines for the preparation of the Supplement to the Pharmacopœia of India, I met with this root and suspected it to be the produce of the above plant. I made myself sure on this point afterwards by comparing it to the Atís of Calcutta and Bombay. (See *Supplement to the Pharmacopœia of India*, p. 28.) This drug is generally imported to Madras from Bombay and sometimes from Calcutta. When a large quantity of it is examined, there are generally two or three kinds of roots, differing distinctly from each other in one or two points. The first and most common

of these is the *white* variety **(No. 5)**; the second, the black variety **(No. 6)**; and the third, the *cylindrical* **(No. 7).** The white variety or *Atis* is a tuberous root, conical, or ovoid with a tapering point towards the lower; from 1 to 2 inches in length, about the same in circumference at its base and upper end; from 10 to 50 grains in weight; grey or of a pale ash-color externally with more and less white scars of rootlets on the surface, and white internally; and inodorous with a pure bitter taste and without the least acridity and sweetness. The roots in the black variety are brown or deep-brown externally, and quite white internally, and the only difference between this and the other varieties is its external color. The black or *Káli-vajje-turki* is a very rare variety and not found in any of the bazaars of Southern India at present. Though I had obtained it twice before from Bombay some years ago, yet failed to get it on the present occasion. The roots representing this variety in my Collection are from Calcutta, and are not a good specimen of it, being paler than they generally are. The cylindrical variety is long, thin and cylindrical with little or no point at either end, and differs only in shape from the white. The cylindrical is not a separate variety in my opinion, but is sometimes sold as such in Madras under the Dukhni name of *Lambi-vajje-turki.* All the varieties of *Atis* agree with each other in five characters, which are invariable, namely, the whiteness of the substance internally, the pure bitter taste without the least acridity or sweetness, and the formation of a farinaceous nature. The combination of these five characters is a very good and sure criterion for distinguishing the *Atis* and its varieties from all kinds of aconite and other roots which many bear a resemblance to them.

The white or common variety is a very useful antiperiodic and antipyretic; but to ensure its best effects it is required to be administered in its full medicinal doses, which are, according to my own experience, from one to two drachms. It is quite safe up to two drachms and a half. In smaller doses (twenty to forty grains) it is a good tonic, but its action as an antiperiodic is very feeble. Although *Vajje turki*, *Ativadayam* and *Ati-vasa* are the correct vernacular names of this drug, they are also applied wrongly in the bazaars of Southern India to another cheaper root, and the latter is consequently often confounded with the former. The confusion is avoided if the words *vilayati*, *shimai* and *simá* (each of which means foreign), are added to the above synonyms. as is the case under the head of "*Synonyms*" in this article.

The thin cylindrical roots known in the bazaars as *Nattuati-vadayam* or country atis are derived from *Cryptocorine spiralis* and a species of *Lagenandra*, plants belonging to the natural order Aroideæ.

† **Nigella sativa,** *Linn.* **8.**

Habitat.—Cultivated in many parts of India.

Part Used.—The seeds.

Synonyms.—Nigella seeds, *Eng.* Kálá-zirá, *Duk.* Kalónji, *Hind.* Karun-shíragam, *Tam.* Nallajila-kara, *Tel.* Karun-chírakam, *Malyal.* Kare-jíraga, *Can.* Kálá-jíra, *Beng.* Kamúne-asvad, *Arab.* Siyah-dánah, *Pers.*

Local Sources.— Common in the bazaars of India.

Price.—Wholesale, Rs. 2½ per maund; retail or bazaar, As. 2 per pound.

Physiological Actions.—Stomachic, carminative, stimulant, tonic, febrifuge, and anthelmintic.

Therapeutic Uses.—Have been found serviceable in some forms of dyspepsia and debility, and also in some slight cases of fever in children. While taking this medicine for one of the above diseases, some children have been observed to pass out round worms.

Preparations.—Powder and Tincture; the latter being prepared in the usual way with two and a half ounces of the powdered seeds to one pint of rectified spirit.

Dose.—Of the powder, from half a drachm to two drachms; and of the tincture, from one to two fluid drachms.

European Drugs for which they may be substituted.—Ol. menthæ piper., cascarilla bark and santonin.

Remarks.—The nigella seeds bear a great resemblance to a coarse gun-powder, being small, triangular, and of a dark-brown color externally. They are pale-white internally, slightly bitter and aromatic in taste, and possess a peculiar and agreeable aromatic odour. Their active principle is an essential oil. They are used by Muhammadans both in medicine and cookery.

‡ Aconitum. *Sp. of.* 9 and 10.

Habitat.—Himalayas.

Part Used.—The root.

Synonym.—Jadvár, *Arab.*

Local Sources.—The true jadvár is not found in the bazaars of Madras at present. It is generally sent for from Calcutta, Bombay, or Hyderabad.

Price.—Extremely dear at Madras, but much cheaper in the other cities I have just named. The bazaar price at Calcutta is As. 12, at Bombay Rs. 1½, and at Hyderabad Rs. 2 per pound, respectively.

Physiological Actions and Therapeutic Uses.—It is supposed to be the best antidote for aconite root and some other vegetable poisons, and enjoys the greatest repute as a nervine tonic and aphrodisiac. It is frequently resorted to by the Hakíms in many diseases of the brain, as paralysis, epilepsy, &c.; but I can say nothing about its medicinal value from my own experience, being unable to employ it in my practice in consequence of its dearness and scarcity.

Preparations and Doses.—It is generally used in substance in the form of a draught with some syrup, &c.; and its dose marked in some native medical works is about a drachm (?).

Remarks.—As already explained under *Aconitum ferox*, all the roots of non-poisonous species of *Aconitum*, whose length is invariably below or not more than one inch and a half, are the costly drugs known as *Jadvár* in India and many other parts of Asia, except the root of *Aconitum heterophyllum*. As *Jadvár* is well known to grow

on the Himalayas and in the localities where *Aconitum ferox* and other species of *Aconitum* are found, it may be much cheaper and more easily procurable in Northern Hindústan; but it is extremely dear and scarce in Southern India. In fact, the real drug is seldom or never found in Madras, and what is occasionally offered for sale here as *Jadvár* are some false or artificial roots, kept in oil under the pretence of preserving them from decay and insects. The fraud, however, is easily exposed, the false roots being generally more or less smooth and shining, and quite devoid of the natural shrivelled and shrunken appearance of the true *Jadvár*. The Native medical works speak of four or five varieties of this drug; but I have seen only two, which are as follows:—

(*a*) The variety of Jadvár which is comparatively cheap and easily procurable at Calcutta **(No. 9)** is a tuberous root, varying in length from three-fourths of an inch to one and a half inches, and of about the same circumference at its base; conical, not round, but much shrivelled, shrunken, and depressed irregularly; brown externally and internally; cuts easily and smoothly, being somewhat soft in texture; and though distinctly bitter, it generally imparts a slight sweetish taste at first. It is quite free from acrid and tingling sensations when chewed.

(*b*) The second is the variety obtained from Hyderabad **(No. 10)**. This root differs from the preceding variety chiefly in its size, taste, and texture, which is smaller, purely bitter, and much harder, respectively.

The root under examination has more names than one, but all the synonyms, except *Jadvár*, are not confined to it, and they, therefore, should not be relied upon in dealing with this drug.

MAGNOLIACEÆ.

* Illicium verum. *Hook*, 11.

Habitat.—China and Cochin-China.

Parts Used.—The fruit and essential oil.

Synonyms.—Star-anise, *Eng.* Badiane, Anisétoilé, *Fr.* Sternanis, *Ger.* Anas-phal, *Duk.* Anás-phal, *Hind.* Annashuppu, *Tam.* Anásapuvvu, *Tel.* Bádiyáne-*khṭatái*, *Arab.* Ráziyánahe-*khaṭái*, *Pers.*

Local Sources.—Common in all the large bazaars of India.

Price.—Wholesale, Rs. 5 per maund; retail or bazaar, As. 4 per pound.

Physiological Actions.—Stomachic, carminative, and stimulant tonic.

Therapeutic Uses.—Useful in some mild cases of dyspepsia and debility.

Preparations.—Powder and Volatile Oil.

Dose.—Of the powder, from ten to fifteen grains; and of the oil, from four to ten drops.

European Drugs for which they may be substituted.—For Ol. menth. piper., and the oil of *Pimpinella anisum*.

Remarks.—This is a very handsome drug and bears a great resemblance to a star in its form, hence its English synonym, *star-anise*.

The volatile oil obtained from this fruit forms the *Oil of Anise* of commerce, which is an important drug; but I have used the fruit itself in powder in many ordinary cases of dyspepsia and debility with pretty good results. It is generally imported to Madras from Calcutta.

Michelia Champaca, *Linn.* 12 and 13.

Habitat.—Cochin-China, Java, and many parts of India.

Parts Used.—The flowers **(No. 12)** and bark **(No. 13).**

Synonyms.—Of the flowers—Champé-ké-phú, *Hind.* and *Duk.* Shampangi-pú, *Tam.* Sampangi-puvvu, *Tel.* Chempakap-pú, *Malyal.* Sampage-puvvu, *Can.* Chámpá, *Beng.* Champaka-pushpam, *Sans.* Chámpécha-phúla, *Mah.* Sáppu, *Cing.* Of the bark—Champé-kíchhál, *Hind.* and *Duk.* Shampangi-pattai, *Tam.* Sampangi-patta, *Tel.*

Local Sources.—The flowers are common in the bazaars of Southern India, but the bark is neither sold nor could be collected without great difficulty except on the hills of the Western Coast.

Price.—Of the flowers—Wholesale, Rs. 5 per maund; retail or bazaar, As. 3 per pound.

Physiological Actions.—The flowers are a very efficient stimulant, antispasmodic, tonic, stomachic and carminative; and the bark, an antiperiodic.

Therapeutic Uses.—The flowers are highly useful in all the diseases and conditions in which Spirit. ammon. arom., Tinct. moschi, Tinct. cardam. comp. and Tinct. cascarillæ are indicated. The bark has been found useful in some cases of jungle fever.

Preparations.—Of the flowers—Infusion and Tincture; prepared in the ordinary way, the proportion of the flowers, in coarse powder, being two ounces and a half to one pint of boiling water in the former, and to the same quantity of rectified spirit in the latter. Of the bark—Decoction; prepared by boiling two ounces and a half of the bark in two pints of water, till the liquid is reduced to one pint.

Dose.—Of both the Infusion of the flowers and the Decoction of the bark, from one and a half to three fluid ounces; and of the Tincture of the flowers, from one to two fluid drachms; three or four times in the 24 hours.

European Drugs for which they may be substituted.—The flowers, for Spirit. ammon. arom., Tinct. moschi, Tinct. cardamomi. comp., and Tinct. cascarillæ; and the bark, for cinchona and its alkaloids.

Remarks.—I have lately found that the flowers of *Michelia Champaca* are not only the best, cheapest and most easily procurable part of that plant, but also one of the cheapest, commonest and most useful drugs in this country. Before adopting this drug in my practice, I made some trials of it on some healthy persons, including myself, and found its physiological actions to resemble more those of Spirit. ammon. arom. and other medicines mentioned under the head of "Therapeutic uses" than any other. The tincture of the flowers is much more efficient than their decoction, and to ensure the best effects of the former in severe or special cases, it should be used

repeatedly in the same way as other stimulants are under similar circumstances. Although *M. Champaca* is met with in many places of Southern India, it is very scarce in some localities. Madras is an example of the latter, and there are not more than two or three plants in the whole of this city. The dry flowers, however, are common and abundant in the bazaar, as already mentioned.

MENISPERMACEÆ.

* Anamirta cocculus, *W. et A.* 14.

Habitat.—In many parts of India.

Part Used.—The fruit.

Synonyms.—Cocculus Indicus, *Eng.* Coque du Levant, *Fr.* Kokkels Koorner, *Ger.* Kákmári-ké-bínj, *Hind.* and *Duk.* Kákkáy-kollivirai, *Tam.* Kākmári-vittulu, *Tel.* Kárinta-kattin-káya, *Malyal.* Kákamári-bíja, *Can.*

Local Sources.—One of the commonest drugs in the Indian bazaars.

Price.—Wholesale, Rs. 4 per maund; retail or bazaar, As. 2 per pound.

Physiological Actions.—Used externally as an insecticide.

Therapeutic Uses.—Useful for destroying pediculi and curing scabies, ring-worm, and a few other skin diseases.

Preparations.—Ointment and oil.

European Drugs for which they may be substituted.—Ung. hydrarg. and Ung. hydrarg. nitratis.

Remarks.—The fruits are an active poison in large doses, but not in small ones. I have taken the drug myself up to five grains, three times a day, without any effect, good or bad. The cheapest and most convenient way of using it externally is in the form of an oily mixture with cocoanut oil, in the proportion of one drachm of the former to one ounce of the latter. The meaning of all the vernacular synonyms of the drug is "Crowkiller," because it is used sometimes in this country for that purpose. The berries are also mixed up with the flour of wheat or crumb of bread and thrown in water to stupify fish so that they may be easily taken. The active principle of the seed is *picrotoxin*.

* Tinospora cordifolia, *Miers.* (Cocculus cordifolius, *DC.*) 15, 16, 17, and 18.

Habitat.—Common all over India.

Parts Used.—The roots, stems, and a watery extract.

Synonyms.—Of the plant or stem **(No. 15)**—Gul-bél, *Duk.* and *Pers.* Gulanchá, *Hind.* and *Beng.* Shíndil-koḍi, *Tam.* Tippatige, *Tel.* Amrúta-vaḷḷi, *Malyal.* Amrúta-baḷḷi, *Can.* Gula-véli, *Mah.* Gulvéḷ, *Guz.* Sóma-valli, *Sans.* Rasa-kinda, *Cing.* Sinza-manne, *Bur.* Giló, *Arab.* Of the root **(No. 16)**—Gul-bél-kí-jaṛ, *Duk.* Gulanchákí-jaṛ, *Hind.* and *Beng.* Shíndil-koḍi-vér, *Tam.* Tippa-tége-véru,

Tel. Of the watery extract—Satte-gilo, *Arab.*, *Pers.* and *Hind.* Gul-bél-ká-sat, *Duk.* Shíndil-shakkarai, *Tam.* Tippa-tíge-sattu, *Tel.* Paló, *Beng.*

Local Sources.—Common in the bazaars of India.

Price.—Of the stem—Wholesale, Rs. 1½ per maund; retail or bazaar, As. 2 per pound. Of the watery extract—Wholesale, Rs. 30 per maund; retail or bazaar, Rs. 1½ per pound. The root is not generally sold in the bazaar, but can be collected without difficulty at the cost of collection.

Physiological Actions.—Alterative tonic, antiperiodic and antipyretic.

Therapeutic Uses.—The root and stem are useful in slight cases of both continued and intermittent fevers, in mild forms of secondary affections and rheumatism, in jaundice and general debility after longstanding sickness. The watery extract is much more useful in all the diseases I have just named, and has also a beneficial influence over the enlargement and other affections of the spleen.

Preparations.—Infusion, Tincture and Extract. Infusion: Take of the stem or root, cut into small pieces and slightly bruised, two ounces and a half; boiling water, one pint; macerate in a covered vessel for two hours and strain. Tincture: Take of the stem or root, cut into small pieces and bruised, five ounces; proof spirit, one pint; macerate for seven days in a closed vessel, with occasional agitation, filter and add sufficient spirit to make one pint. The preparation of the extract is described under the head of "*Remarks.*"

Doses.—Of the Infusion, from one to three fluid ounces; of the Tincture, from one to two fluid drachms; and of the Extract, from one to two drachms.

European Drugs for which they may be substituted.—Jamaica sarsaparilla, Potass. iodid., Quinine and other alkaloids of cinchona, James' powder, Pulv. cinchon. and Pulv. antimonialis.

Remarks.—There is a general belief amongst the Muhammadans of India that the *Gul-bél* growing on a margosa tree is more efficacious as a medicine than that which may be found on other kinds of trees, hedges, &c., and they therefore cultivate the plant in their own houses and gardens and make it run over *Azadirachta Indica.* The watery extract of *T. cordifolia* (*satte-gilo* or *paló*) is in great vogue as a remedy in fevers, and is called "Indian quinine" by some Hakíms. This is, of course, a great exaggeration of its value, but there is no doubt that it is a very useful drug, especially in some very obstinate, low and long standing continued, remittent and typhoid fevers. Its action is generally more satisfactory when employed in combination with other drugs of similar medical properties, and it is therefore one of the chief ingredients in a very valuable febrifuge prescription I have given under *Viola odorata.* Although it is not a costly drug, yet it is generally substituted by, or adulterated with, many cheaper substances in the bazaars of India; so much so that out of the seven specimens I have received from different places, including Calcutta, Hyderabad and Lucknow, none is found to be genuine. They are all very bitter and of various colors; whereas the real *satte-gilo* is either tasteless or slightly bitterish in taste, white in color, if it is prepared from

the roots of *T. cordifolia*, and greenish-white or greenish-brown, if from the stems. It occurs in powder or loose and flat cake-like pieces. It is prepared easily by cutting the fresh stem into small pieces, which are bruised in a stone or wooden mortar and soaked in water from six to twelve hours. The mass is then rubbed, squeezed and separated from the fluid by straining the latter through cloth. The fluid being evaporated to dryness in the sun, the residue is the *satte-giló*. The last process is generally repeated several times with a view to make the drug whiter; but such repetitions, in my opinion, are not only unnecessary, but detrimental to its effects. The thicker the *gul-bél* or its root is, the better for the preparation of *satte-giló;* and the plant is known to attain sometimes the thickness of a man's arm. A transverse section of the stem and root shows the wood to consist of a very porous tissue, traversed by conspicuous medullary rays, with or without concentric zones. The specimens of the *satte-giló* in my Collection **(Nos. 17** and **18)** are genuine, being prepared by myself for the Calcutta International Exhibition; the former from the stems, and the latter from the roots. Flückiger has found the alkaloid berberine and a glucoside to be the sources of the bitterness.

† Coscinium fenestratum, *Colebr.* 19.

Habitat.—Ceylon and Malabar.

Part Used.—The wood.

Synonyms.—Jhár-kí-haldí, *Duk.* Mara-manjaḷ, *Tam.* and *Malyal.* Mánu-puspu, *Tel.* Maráda-arishna, *Can.* Jhádí-hāladé, *Mah.* Venivel, *Cing.*

Local Sources.—Common in large bazaars in Southern India.

Price.—Wholesale, Rs. 1½ per maund; retail or bazaar, As. 2 per pound.

Physiological Actions.—Antipyretic, antiperiodic, tonic and stomachic.

Therapeutic Uses.—Serviceable in slight cases of continued and intermittent fevers, in debility and certain forms of dyspepsia.

Active Principle.—The alkaloid berberine.

Preparations and Doses.—The same as those of the root of *Berberis aristata* and other species.

European Drugs for which it may be substituted.—For cinchona bark, gentian and calumba.

Remarks.—This drug is yellow like turmeric, but much larger, hence the meaning of all the vernacular names "tree turmeric." It is wrongly sold in all the bazaars of Southern India as *dár-hatd*, which is properly the name of the wood and root of *Berberis aristata* and a few other species of Berberis. The wood of *C. fenestratum*, however, is easily distinguished by the appearance of its cut end, which displays the wood to be very porous, and is traversed by peculiar medullary rays without any concentric circles; whilst that of the wood or root of all the species of *Berberis* presents no particular structure, but is very hard and woody.

† Cocculus villosus, *DC.* **20.**

Habitat.—In most parts of India.

Parts Used.—The leaves and roots.

Synonyms.—Kaṭṭuk-koḍi-ilai, *Tam.* Dúsari-tége-áku, *Tel.* Chóti-dángrí-ká-pattá, Jamtí-ká-pattá, *Duk.*

Local Sources and Price.—Not sold in the bazaar, but can be collected for the mere cost.

Physiological Actions.—Demulcent and refrigerant.

Therapeutic Uses.—Of great use in gonorrhœa, strangury, and irritation of the bladder. The beneficial influence it exercises over the mucous membrane of the genito-urinary organs is generally more than expected from it as a mere demulcent and refrigerant. The activity of the drug is probably dependent upon one or more alkaloids.

Preparations.—The cold water rendered thick and mucilaginous by agitating briskly the fresh leaves, and sweetened with sugar, is a very cool and tasteful drink; and the powder of the dry leaves mixed with water and sugar possesses also the same properties.

Dose.—Of the mucilage, from four to eight ounces; and of the powdered leaves, from one to two drachms.

European Drugs for which it may be substituted.—Pareira brava, sarsaparilla and copaiba.

‡ Cissampelos Pareira, *Linn.* **21.**

Habitat.—Tropical and sub-tropical India from Scinde to Ceylon.

Part Used.—The root.

Synonyms.—False or East Indian Pareira root, *Eng.* Poon mooshtie, *Tam.*

Local Sources and Price.—Not sold in the bazaar. The root in my Collection of Drugs **(No. 21)** is from a hedge in Madras.

Physiological Actions.—Demulcent, sedative, and slightly diuretic.

Therapeutic Uses.—Has a beneficial influence over all the diseases of the bladder, &c., in which Pareira Brava is useful.

Active Principle.—A bitter alkaloid identical with bebeerine.

Preparation.—Decoction: Take of the root, cut into small pieces and slightly bruised, two ounces and a half; water one pint and a half; boil on a slow fire till the liquid is reduced to one pint, cool, strain, and keep it in a corked bottle.

Dose.—From one to three fluid ounces.

European Drugs for which it may be substituted.—For the Pareira root imported from Europe.

Remarks.—The True Pareira Brava is derived from *Chondodendron tomentosum*, a plant of this natural order growing in South America. The roots in the Collection **(No. 21)** possess almost all the characters of the true Pareira root described in the *Pharmacographia*, p. 27, except the thickness, which is not more than half or three-quarters of an inch, owing, in my opinion, to the young age of the plant. When dug out

about a few years ago, they were long and branching, tortuous or serpentine, but were cut afterwards into small pieces. The bark is brown or greyish-brown, wrinkled longitudinally and crossed transversely by annular elevations; interior woody, porous, and yellowish-white. The root breaks with a coarse fibrous fracture, and a transverse section of it exhibits more or less concentric rings and medullary rays. The taste is bitter. The plant was first noticed growing in Madras by T. Abboy Naidoo, Herbarium Keeper under Dr. G. Bidie, M.B. & C.I.E., in the Government Central Museum.

BERBERIDEÆ.

* Berberis aristata, *DC.* (B. tinctoria, *Lesch*). 22 and 23.

Habitat.—Himalayas, Nílgiris, Shevaroy Hills and Ceylon.

Parts Used.—The root **(No. 22)**, root-bark and wood.

Synonyms.—Of the root—Nepal Barberry root, *Eng.* Epine vinette, *Fr.* Berberitze, *Ger.* Dár-hald, *Arab.*, *Pers.* and *Hind.*

Local Sources and Price.—Not sold in the bazaar, but can be obtained from the Nílgiris at the cost of collection and transmission.

Physiological Actions.—Diaphoretic, antipyretic, antiperiodic and tonic.

Therapeutic Uses.—The root is highly useful in all forms of idiopathic and uncomplicated fevers, whether continued or periodical.

Preparations.—Of the root—Decoction, Tincture and watery extract. Decoction: Take of the root, in shavings **(No. 23)** or coarse powder, six ounces; water two pints and a half; boil on a slow fire till the liquid is reduced to one pint. Tincture: Take of the root, in shavings or coarse powder, six ounces; proof spirit one pint; macerate for seven days with occasional agitation, strain and add more proof spirit to make one pint. Extract: Take the shavings or coarse powder of the root in any quantity, boil with water till the liquor becomes somewhat thick, strain and evaporate on a sand-bath to the consistence of an extract.

Doses.—Of the decoction, from two to six fluid ounces; of the tincture, from two to six fluid drachms; and of the extract, from one to two drachms.

European Medicines for which they may be substituted.—For Warburg's tincture and James' powder, as a diaphoretic and antipyretic; for quinine and other alkaloids of cinchona, as an antiperiodic; and for gentian and calumba, as a tonic.

Remarks.—Instead of the root-bark of *B. aristata* I have used the root itself in my practice and found it to be equal, if not superior, to the former. Its advantages over the root-bark are that it is about fifty times cheaper and more abundant. The root occurs in pieces varying in length from 6 to 12 inches, and in thickness from 2 or 3 to 8 inches; it is yellow internally, bitter in taste, and rapidly imparts its color and taste to water if soaked. It is very hard, heavy, odorless, and there is nothing particular in its structure. The pieces are covered sometimes with a very thin dark-brown or yellowish-brown bark, but generally deprived of it. The root is one of the few best medicines in India, and deserves a special attention of the medical profession. I shall, therefore,

speak of its therapeutic uses more fully here than under the heading "*Therapeutic Uses.*"—As an antiperiodic and antipyretic it is at least quite equal to quinine and Warburg's tincture respectively; and as a diaphoretic, decidedly superior to Pulv. Jacobi vera or James' powder. It is of the greatest service in relieving pyrexia and in converting the continued and remittent fevers into the intermittent; and also in preventing the return of the paroxysms of the latter. In addition to the cheapness, its advantages over Warburg's tincture and quinine are that, however repeatedly it may be used, it neither produces a great depression of the system like the former, nor any bad effect on the stomach, bowels, brain or the organs of hearing, like the latter. Unlike the alkaloids of cinchona, it can be employed beneficially in the presence of fever. One of the best preparations of the root is the decoction, twelve ounces of which is equal to one bottle of Warburg's tincture, and if administered during a paroxysm in two doses (℥ vi each) at the interval of two or three hours, it relieves the fever by producing as copious a perspiration as the above tincture. Six drachms of the tincture of the root is also equal to one bottle of Warburg's tincture, and, if used in two doses with water during a paroxysm, it produces precisely the same effect as the decoction. There is no difference between the actions of the tincture and decoction of the root, but the former is preferable to the latter for two reasons, one of which is the smallness of its dose, and the other, it can be prepared in a large quantity and kept always ready for use. To ensure the full antiperiodic effect, the tincture or decoction should not only be employed in the paroxysm, as described above, but also in the same dose every fourth or fifth hour during the intermission; and then, it completes the cure if it be continued in smaller doses for four or five days more after the fever ceases to return. Used in the manner explained above, the tincture and decoction have proved themselves successful in many cases of malarious and jungle fevers, in a few of which, quinine with arsenic had failed previously. The watery extract and the simple powder of the root under consideration are very inferior preparations, and generally very indifferent in their actions. The great and continuous heat, which is required to prepare the extract, seems to destroy its efficacy to a great extent. The wood of *B. aristata*, particularly that of the stem, is also possessed with the same medicinal properties as those of the root, but much inferior to the latter. The root and other parts of this plant, like those of some other species of Berberis, which will be noticed presently, owe their action to an active principle called *Berberine*.

* **Berberis asiatica,** *DC.* **24.**
* **Berberis Lycium,** *Royle.* **25.**
‡ **Berberis vulgaris,** *Linn.* **26.**

Habitat.—Himalayas.

Parts Used.—The wood, root, watery extract and berries.

Synonyms.—Of the wood and root **(No. 24)**—Indian Barberry, *Eng.* Epine vinette, *Fr.* Berberitze, *Ger.* Dár-hald, *Arab.*, *Pers.* and *Hind.* Of the watery extract **(No. 25)**—Rasvat, Rusot, *Hind.* Huzuzehindí, Fíl-zahraj, *Arab.* Fíl-zahrah, *Pers.* Of the berries **(No. 26)**—Anbar-báris, Ambar-báris, *Arab.* Zarishk, *Pers.* and *Hind.*

Local Sources.—The watery extract and berries are found in the bazaars of Southern India, but not the wood and root. The latter are common in the bazaars of Central and Northern India, and whether sold together or separately, their native names are the same. The wood and root **(No. 24)** in my Collection are from Lucknow.

Price.—Of *Rasvat*—Wholesale, Rs. 35 per maund; retail or bazaar, Rs. 2¼ per pound. Of the berries—Wholesale, Rs. 6 per maund; retail or bazaar, As. 6 per pound.

Physiological Actions.—The wood and root are diaphoretic, antipyretic, antiperiodic and tonic; the watery extract is a local remedy in ophthalmia; and the berries are refrigerant and astringent.

Therapeutic Uses.—The root is very efficient in all kinds of simple idiopathic and uncomplicated fevers, whether continued or periodical; and the wood is less so. Applied externally around the eye, the watery extract sold in the bazaar (Rasvat) effects a cure in ordinary cases of ophthalmia. The berries are useful in chronic diarrhœa and in passive hæmorrhage from the bowels and stomach, particularly in combination with diluted sulphuric acid. They are also of use in some febrile affections, and relieve thirst and remove dryness if they be kept in the mouth.

Preparations and Doses.—The preparations and doses of the wood and root of the plants under consideration are the same as those of the root of *Berberis aristata.* The berries are generally used in the form of a draught, prepared by rubbing and mixing them with water and straining the liquid through cloth. Their dose is from thirty grains to one drachm.

European Drugs for which they may be substituted.—The wood and root for Warburg's tincture and Pulv. Jacobi vera, as a diaphoretic and antipyretic; for quinine and other alkaloids of cinchona, as an antiperiodic; and for gentian and calumba, as a tonic. The berries, for acidum phosphoricum dilutum, as a remedy for quenching thirst; and for acidum sulphuricum dilutum and acidum gallicum, as an astringent.

Remarks.—The remarks I have made on the preceding article (*B. aristata*) as to its medical properties, uses, preparations, doses, &c., are applicable to the drugs under examination. *Dár-hald* is the correct Arabic synonym of the wood and root of *B. asiatica, B. Lycium*, and a few other species of Berberis, and is applied to the real drugs in Central and Northern India. In Southern India, however, it is occasionally misapplied to the wood of *Coscinium fenestratum*. See remarks under the last-named plant.

NYMPHÆACEÆ.

‡ **Nymphæa Lotus,** *Linn.* **(N. edulis,** *DC.***) 27, 28 and 29.**

The red, pink or crimson variety of this species is more commonly known as *N. rubra* of Roxburgh.

Habitat.—One of the common aquatic plants in India.

Parts Used.—The flowers **(27)**, seeds **(28)** and roots **(29)**.

Synonyms.—Of the flowers—Lál-paphúl, *Hind.* Lál-chhóṭé-kanval-ké-phúl or Lál-chhóṭé-nílufar-ké-phúl, *Duk.* Shivappu-alli-pú, *Tam.* Erra-alli-támara-puvvu, *Tel.* Of the seeds—Lál-paphúl-ké-bínj, *Hind.* Lál-chhóṭé-kanval-ké-bínj or Lál-chhóṭé-nílúfar-ké-bínj, *Duk.* Shivappu-alli-virai, *Tam.* Erra-alli-támara-vittulu, *Tel.* Of the roots—Lál-paphúl-ki-jaṛ, *Hind.* Lál-chhóṭe-kanval-kí-jaṛ or Lál-chhóṭé-nílúfar-kí-jaṛ, *Duk.* Shivappu-alli-vér, *Tam.* Erra-alli-támara-veru, *Tel.*

Local Sources.—Found in some large bazaars of Southern India.

Price.—Of the flowers—Wholesale, Rs. 5 per maund; retail or bazaar, As. 4 per pound. Of the seeds—Wholesale, Rs. 8 per maund; retail or bazaar, As. 7 per pound. Of the roots—Wholesale, Rs. 6 per maund; retail or bazaar, As. 6 per pound.

Physiological Actions.—The flowers or rather petals are cardiac tonic, refrigerant and diuretic; the seeds, demulcent and nutrient; and the roots, stomachic, demulcent and astringent.

Therapeutic Uses.—The flowers are useful in nervous debility, functional palpitation, and some slight and chronic cases of low and hectic fevers; the seeds, in some cases of debility and dyspepsia; and the roots, in dysentery, diarrhœa and dyspepsia. The first good effect of the root in dysentery is the rapid disappearance of blood under its use.

Preparations.—The best and most useful preparation of the flowers is the syrup, prepared as follows:—Take of the petals, 6 ounces if dry, and 12 ounces if fresh; water $2\frac{1}{2}$ pints; boil on a slow fire till the liquid is reduced to $1\frac{1}{4}$ pints. When cool, rub and squeeze the flowers and strain the liquid through cloth. Add to this liquid 12 ounces of refined sugar and boil it again on a very slow fire till the syrup is reduced to 1 pint. The most convenient way of using the seeds and roots is in simple powder.

Doses.—Of the syrup of flowers, from two to four drachms; of the powder of the seeds, from forty grains to one drachm; and of the powder of the root, from thirty to fifty grains; to be repeated three or four times in the 24 hours.

European Drugs for which they may be substituted.—The flowers for digitalis; the seeds for Iceland moss, tragacanth and pepsine; and the roots for sub-nitrate of bismuth, pepsine and gallic acid.

Remarks.—The dry petals of *N. rubra* are from 2 to 3 inches long, broad at the base and lanceolate towards the end, and of pink, crimson or reddish-brown color without any distinct smell or taste. The seeds are small, round, about twice the size of the mustard seeds, pale brown in color, devoid of smell and somewhat mucilaginous in taste. The root is sold in the bazaar in round and flat slices, varying from 1 to 2 or $2\frac{1}{2}$ inches in diameter, pale or dirty white in color, odorless, and almost insipid with an uneven or irregular and more or less hairy edge.

‡ **Nymphæa Lotus**, *Linn.* **(N. edulis**, *DC.*) **30, 31 and 32.**

The white-flowered variety.

Habitat.—One of the commonest aquatic plants in India.

Parts Used.—The flowers **(30)**, seeds **(31)** and roots **(32)**.

Synonyms.—Of the flowers—Suféd-paphúl, *Hind.* Suféd-chhóṭé-kanval-ké-phúl or Suféd-chhóṭé-nílúfar-ké-phúl, *Duk.* Veḷḷai-alli-pú, *Tam.* Tella-alli-támara-puvvu, *Tel.* Of the seeds—Suféd-paphúl-ké-bínj, *Hind.* Suféd-chhóṭé-kanval-ké-bínj or Suféd-chhóṭé-nílúfar-ké-bínj, *Duk.* Veḷḷai-alli-virai, *Tam.* Tella-alli-támara-vittulu, *Tel.* Of the roots—Suféd-paphúl-kí-jaṛ, *Hind.* Suféd-chhóṭé-kanval-kí-jaṛ or Suféd-chhóṭé-nílúfar-kí-jaṛ, *Duk.* Veḷḷai-alli-vér, *Tam.* Tella-alli-támara-véru, *Tel.*

Local Sources, Price, Physiological Actions, Therapeutic Uses, Doses and European Drugs for which they may be substituted.—The same as those detailed in the preceding article.

Remarks.—The white-flowered variety of *N. Lotus* is more common in Madras than the one with red flowers (*N. rubra, Roxb.*). The chief differences between these varieties are as follow:—The flowers, including the stamens, of *N. rubra* are red, pink, crimson or rosy; and the leaves, particularly their upper surface, is pinkish brown; while the flowers of the white variety are white or pinkish white with yellow stamens, and the upper surface of the leaves is green. The flowers and leaves of the latter are also about one-third smaller than those of the former.

The white-flowered variety under immediate consideration is different from *N. alba, Linn.*, which is not a variety but a separate species of *Nymphæa.*

The dry flowers or petals of the white variety of *N. Lotus* are pale or dirty white in their color, from $1\frac{1}{2}$ to 2 or $2\frac{1}{2}$ inches long, insipid and odorless. There is no difference whatever between the seeds and roots of all the varieties of *N. Lotus.*

‡ **Nelumbium speciosum,** *Willd.* **33, 34 and 35.** The red, pink, crimson or rose-colored variety.

Habitat.—A very common aquatic plant in India.

Parts Used.—The flowers **(No. 33),** seeds **(No. 34)** and roots **(No. 35).**

Synonyms.—Of the flowers—Flowers of the red variety of the Egyptian or Pythagorean Bean, *Eng.* Lál-kanval-ké-phúl or Lál-nílú-far-ké-phúl, *Hind.* and *Duk.* Shivappu-támara-pú, *Tam.* Erra-támara-puvvu, *Tel.* Of the seeds—Lál-kanval-ké-bínj or Lál-nílú-far-ké-bínj, *Hind.* and *Duk.* Shivappu-támara-virai, *Tam.* Erra-támara-vittulu, *Tel.* Of the roots—Lál-kanval-kí-jaṛ or Lál-nílú-far-kí-jaṛ, *Hind.* and *Duk.* Shivappu-támara-vér, *Tam.* Erra-támara-véru, *Tel.*

Local Sources.—Met with in many large bazaars of India.

Price.—Of the flowers—Wholesale, Rs. 5 per maund; retail or bazaar, As. 4 per pound. Of the seeds—Wholesale, Rs. 6 per maund; retail or bazaar, As. 6 per pound. Of the roots—Wholesale, Rs. 7 per maund; retail or bazaar, As. 6 per pound.

Physiological Actions, Therapeutic Uses, Preparations, Doses and European Drugs for which they may be substituted.—The same as those of the corresponding parts of *Nymphæa Lotus*.

Remarks.—The dry petals of the red variety of *Nelumbium speciosum* are from 2½ to 3½ inches long, elliptical, pink, crimson or reddish-brown and possess no distinct smell or taste. The seeds or nuts are hard and dark brown, round, oval or oblong, about the size of the seeds of soap-nut tree, with a white, albuminous and slightly sweetish kernel. The root occurs in the bazaar in small and circular pieces, varying in diameter from 3 or 4 lines to 1 inch, with several holes arranged in a circular form with a solitary and generally smaller one in the centre; odorless and slightly mucilaginous in taste. The holes are the result of the cut ends of the spiral tubes. See the last para. in the remarks under the white variety of *N. speciosum*.

‡ **Nelumbium speciosum,** *Willd.* **36, 37 and 38.** The white variety.

Habitat.—A very common aquatic plant in India.

Parts Used.—The flowers **(No. 36),** seeds **(No. 37)** and roots **(No. 38).**

Synonyms.—Of the flowers—Flowers of the white variety of the Egyptian or Pythagorean Bean, *Eng.* Suféd-kanval-ké-phúl or Suféd-nílú-far-ké-phúl, *Hind.* and *Duk.* Vellai-támara-pú, *Tam.* Tella-támara-puvvu, *Tel.* Of the seeds—Suféd-kanval-ké-bínj or Suféd-nílú-far-ké-bínj, *Hind.* and *Duk.* Vellai-támara-virai, *Tam.* Tella-támara-vittulu, *Tel.* Of the roots—Suféd-kanval-kí-jaṛ or Suféd-nílú-far-kí-jaṛ, *Hind.* and *Duk.* Vellai-támara-vér, *Tam.* Tella-támara-véru, *Tel.*

Local Sources, Price, Physiological Actions, Therapeutic Uses, Preparations, Doses, and *European Drugs for which they may be substituted.*—The same as those of the corresponding products of *Nymphæa Lotus.*

Remarks.—The color of the dry petals of this variety of *Nelumbium speciosum* is pale or dirty white, and this is the only difference between them and those of the red variety. The seeds and roots of both varieties are quite identical.

Although there is no difference between the flowers of the red and the white varieties, except the color, the therapeutic uses of the syrup is not quite satisfactory unless it is prepared from the petals of either of them separately, without their admixture.

PAPAVERACEÆ.

* **Papaver somniferum,** *Linn.* **39, 40, 41, 42 and 43.** White or opium poppy.

Habitat.—The white poppy was cultivated in some places of Southern India, as Mysore, Bangalore, &c., until a few years ago, but its cultivation has been since prohibited. Its culture, however, is still

carried on on a very large scale in many parts of Central and Northern India.

Parts Used.—The inspissated juice or opium **(No. 39)**, capsules **(No. 40)**, seeds **(Nos. 41** and **42)** and oil **(No. 43)**.

Synonyms.—Of the inspissated juice—Opium, *Eng.* Afyún, *Hind.*, *Pers.* and *Arab.* Afím, *Duk.* Abini, *Tam.* Abhini, *Tel.* Kasha-kasha-karuppa, *Malyal.* Aphímu, *Can.* Aphím, *Beng.*, *Sans.*, *Mah.* and *Guz.* Abin, *Cing.* Bhain, *Bur.* Of the capsules—Poppy-heads or poppy-capsules, *Eng.* Capsules or Tetes du Pavot, *Fr.* Mohucapseln, *Ger.* Póst or Khashkhash-ká-póst, *Hind.* Khashkhash-kébóndé, *Duk.* Gashagasha-tól or Póstka-tól, *Tam.* Gasagasála-tólu, *Tel.* Kashkashat-tól, *Malyal.* Khaskhas-nu-póst, *Guz.* Qishrul-khashkhásh, *Arab.* Pósté-kóknár, *Pers.* Of the common or white seeds **(No. 41.)**—White poppy seeds, *Eng.* Khashkhásh, *Hind.* and *Pers.* Khashkhash, *Duk.* Gashagasha, *Tam.* Gasagasálu, *Tel.* Kasha-kasḥak-kuru, *Malyal.* Khasakhasi, *Can.* Khaskhas, *Beng.* Póstubéjam, *Sans.* Khasakhasa, *Mah.* Khaskhas, *Guz.* Bhain-zi, *Burm.* Bizrul-khaskhásh, *Arab.* Tukhme-kóknár, *Pers.* Of the black seeds **(No. 42.)**—Black poppy seeds, *Eng.* Káli-khashkhash, *Duk.* Kálí-khashkhásh, *Hind.* Karuppu-gashagasha, *Tam.* Nalla-gasagasálu, *Tel.* Of the oil **(No. 43.)**—Poppy oil, *Eng.* Khashkhásh-ká-tél, *Hind.* Khashkhash-ká-tél, *Duk.* Gashagasha-eṇṇey, *Tam.* Gasagasála-núne, *Tel.*

Local Sources.—The white poppy seeds, capsules and opium are met with in every bazaar of India; the oil of the seeds is not generally kept ready for sale, on account of its getting rancid by keeping; and the black poppy seeds are so rare that I never saw them in the bazaar of Madras. The sample in my collection is from Hyderabad.

Price.—Of opium (the best that could be procured in Madras)—Wholesale, Rs. 13 per pound; retail or bazaar, Rs. $1\frac{1}{4}$ per pollum. Of the capsules—Wholesale, Rs. 6 per maund; retail or bazaar, As. 6 per pound. Of the common or white seeds—Wholesale, Rs. 2 per maund; retail or bazaar, As. $1\frac{1}{4}$ per pound. The poppy oil is much cheaper than the almond oil.

Physiological Actions, Therapeutic Uses, Preparations and Doses.—With the exception of two points the information on *opium* and its chief *alkaloids*, and on the poppy capsules, in the *Pharmacopœia of India* (pp. 13 to 22) and in *Pharmacographia Indica* (pp. 73–108), is so complete that I am unable to add anything to it from my own experience and knowledge, and therefore refer the reader to these works. I shall only speak here of the exceptional points, the first and most important of which is the use of *morphia* in the form of *hypodermic injection*. The introduction of morphia into the system subcutaneously, and the great and immediate relief derived from this drug when employed in this manner, are now established facts, and there are no longer two opinions on the subject. It is so frequently resorted to by our profession at present that there is scarcely any educated medical man who does not use the hypodermic injection in his practice. The diseases which are benefited by it are numerous, but I shall confine my notice to only those which I have cured or relieved myself by this method. It is extremely useful in relieving the pain in all forms of neuralgia, and

it either checks or relieves the fits of asthma, hysteria, catalepsy and epilepsy. No other plan of treatment is so useful as this method in alleviating the excruciating pain or agony of such diseases as the impaction of calculi in the ureter or biliary ducts, or cancer of the stomach, breast or uterus. During the last few years I have succeeded in curing or completely relieving some cases of the former affection (impaction) by the injection of morphia within 10 to 20 minutes ; whereas before that period, I was unable to do the same for a day or two, or, at least, for many hours, by other plans of treatment.

This injection is also a very good and speedy hypnotic, and it therefore produces sleep for some hours (occasionally for more than a day), and successfully the pain in a host of painful and irritative disorders, including fractures and other injuries. Some patients, particularly the Europeans, prefer the injection to all sleeping draughts by the mouth. The dose of morphine I have generally used in this injection is $\frac{1}{4}$ of a grain, and only on a few occasions have I increased it to $\frac{1}{3}$. The solution of morphia which is generally adopted by the profession for subcutaneous use is the one described in the *British Pharmacopœia*, edition of 1885, p. 212.

" Hypodermic Injection of morphine. A solution of acetate of morphine containing one grain of the acetate in 10 minims of the injection.

" *Preparation*.—Dissolve 92 grains of hydrochlorate of morphine in two ounces of distilled water, aiding the solution by gently heating ; then add solution of ammonia so as to precipitate the morphine ; allow it to cool ; collect the precipitate on a filter, wash it with water, and allow it to drain ; then dissolve it with the aid of heat with sufficient acetic acid, add now sufficient distilled water to make the solution measure exactly two ounces. Filter and preserve the product in a stoppered bottle excluded from the light. *Dose by subcutaneous injection*—1 to 5 minims.

" *Characters and Tests*.—A clear solution, free from any solid particles. Very slightly acid to test paper. A fluid drachm, rendered slightly alkaline, by the addition of solution of ammonia, yields a precipitate of morphine, which, after being washed and dried, should weigh 4·25 grains, corresponding to 6 grains of acetate of morphine."

I have lately used the morphine injection with a minute quantity of *atropine* and found the combination to be very satisfactory and advantageous. The atropine being one of the antidotes of morphine, in addition to its being an anodyne and antispasmodic, its combination with the latter drug, not only enhances its general efficacy, but also renders its employment subcutaneously much safer than when it is used alone. As it is extremely difficult to combine morphine and atropine properly in so minute a quantity which is necessary in using them hypodermically, I have availed myself of 'Burroughs, Welcome & Co.'s Hypodermic Tabloids,' which are sold in small tubes in all the cities and towns in South India. They are of different strength, but the one I have generally used is as follows :—

Morphine sulphate $\frac{1}{4}$ grain.
Atropine sulphate $\frac{1}{150}$ grain.

They are very soluble, and each tabloid perfectly dissolves in 12 or 15 minims of water. The necessary apparatus (small glass syringe with 2

hollow needles, &c.) are sold in many druggists' shops and are very cheap at present.

The manner of using the hypodermic injection is pretty easy, namely, fix a sharp hollow needle to the syringe, which should be filled up previously with the solution; pinch up a small fold of the skin, under which pass the needle into the cellular tissues (not muscles); and now press down the piston slowly.

As atropine and morphine are very dear medicines, their employment subcutaneously is very important in an economic point of view, in addition to the great and invaluable use we derive from them in our practice, as already explained. Whether these drugs are injected over or near the painful or affected part, or on a spot far away from it, there is no difference between their effects, and the result is the same in both cases. Therefore, in selecting a spot for hypodermic injection, we must only pay attention to the structure, &c., of the spot, without the least regard to the distance between that spot and the painful or affected part. The parts which are very safe, convenient and generally selected for hypodermic injection are the outer side of the arms, thighs and legs; and next to these are the abdomen, back and shoulders. The parts which should always be avoided are those where some large or pretty large veins, arteries and nerves are known to exist, such as the popliteal space, the bend of the elbow, groin, arm-pit, and the inner side of the arms, thighs and legs; the temple, neck, chest and scalp should also be avoided as they are occasionally known to be unsafe and dangerous places for the operation. The following are a few more precautions:—

Before the injection is commenced, the air should be excluded from the syringe, by slightly pressing the piston so as to throw out one or two minute drops through the needle; the patient should be placed in the recumbent posture during the operation, and also for 10 or 15 minutes afterwards; he should not be disturbed too soon from his sleep, which is one of the desired effects of the injection; and in case of the first injection failing to cure or relieve the disease, for which it is employed, it may be repeated, but not within 3 or 4 hours, or until the patient remains sleepy, giddy or drowsy.

The second exceptional point, which, is omitted in the *Pharmacopœia of India* under the article of *Papaver somniferum*, are the seeds of this plant (poppy seeds), which are emollient, demulcent and nutritive, and prove useful in the form of *Harirá* or a thin congee-like food, made with starch, cow's milk and sugar, in some cases of debility with a weak digestive power. Bruised with water and applied to the vertex, they produce a soothing effect upon the brain and even sleep, and relieve headache and delirium. The application of their oil (poppy oil) to the crown of the head is more convenient and produces the same effects. Poppy seed oil is of a pale golden colour and is similar to linseed oil in its chemical constitution. It is sometimes used as a substitute for olive oil, but being a drying oil it is not nearly so well suited for medicinal purposes as ground-nut oil.

European Drugs for which they may be substituted.—Opium, for the Turkey and other kinds of opium imported from Europe; the seeds for Iceland-moss and almonds; and the oil for almond and olive oils.

† Argemone mexicana, *Linn.* 44, 45, and 46.

Habitat.—America. One of the commonest weeds in India.

Parts Used.—The seeds **(No. 44)**, oil **(No. 45)** and roots **(No. 46)**.

Synonyms.—Of the seeds—Mexican thistle seeds, *Eng.* Baramdandí-ké-bínj or Shiál-kánté-ké-bínj, *Hind.* Bharamdandí-ké-bínj or Pílé-dhatúré-kĕ-bínj, *Duk.* Brimadandu-virai, *Tam.* Bramhadandi-vittulu, *Tel.* Brahmadanti-vitta, *Malyal.* Shiál-kántá-bíj, *Beng.*—Of the oil—Mexican thistle oil, *Eng.* Baramdandí-ká-tél or Shiál-kánté-ká-tél, *Hind.* Bharamdandí-ká-tél or Pílé-dhatúré-ká-tél, *Duk.* Brimadandu-eṇṇey, *Tam.* Bramhadandi-núne, *Tel.* Brahmadantí-eṇṇa, *Malyal.* Shiál-kánta-tél, *Beng.* Of the roots—Mexican thistle root, *Eng.* Baramdandí-kí-jar or Shiál-kánté-kí-jar, *Hind.* Bharamdandí-ké-jar or Pílé-dhatúré-kí-jar, *Duk.* Brimadandu-vér, *Tam.* Bramhadandivéru, *Tel.* Brahmadanṭi-véra, *Mayal.* Shiál-kántá-jar, *Beng.*

Local Sources.—The seeds are sold in some bazaars of Southern India, but not the oil and root. The oil can be prepared very easily, and in any quantity, and the cost of gathering the root is very trifling.

Price.—Of the seeds—Wholesale, Rs. 2 per maund; retail or bazaar, As. 1½ per pound.

Physiological Actions.—The seeds are laxative, emetic, nauseant, expectorant and demulcent; the oil, a drastic purgative, nauseant and expectorant; and the root, an alterative tonic. The seeds and oil have also a beneficial effect over asthma.

Therapeutic Uses.—The seeds are useful in cough and catarrhal affections of the throat and pulmonary mucous membrane, and in pertussis and asthma. Though they do not appear to possess any antispasmodic property, they have a distinct control over asthma, apparently, from their combined actions of nauseant, emetic, expectorant and demulcent. As their use is often accompanied by more or less vomiting and nausea, they are more suited as a laxative medicine to some pulmonary affections than other diseases. The oil is serviceable in some cases in which jalap, rhubarb and castor-oil are indicated, and also in some bronchial and catarrhal affections. The use of the root is attended with benefit in some chronic cases of skin diseases.

Preparations.—As the seeds abound in oil they cannot be reduced easily to a fine powder, and the best and most convenient way of using them is, therefore, in emulsion which is formed by bruising and rubbing them with water, and straining the liquid through cloth. The resulting draught is whitish, quite tasteless, and is rendered very palatable by adding a little sugar or honey to it. The oil may be taken floating on water, in emulsion with mucilage or with sugar. The root is used in decoction by boiling three ounces with one and-a-half pint of water till reduced to one pint.

Doses.—Of the seeds, as a laxative and emetic, from one drachm and a half to two drachms and a half; as a nauseant, expectorant and demulcent, and also as a remedy for asthma, from forty grains to one drachm, three or four times in the twenty-four hours. Of the oil, as a purgative, from twenty to thirty-five minims, the average dose being thirty; as a nauseant and expectorant, and also as a remedy for

asthma, from ten to fifteen minims, three or four times in the twenty-four hours. Of the decoction, from two to three ounces, three times a day.

European Drugs for which they may be substituted.—The seeds for squill, senega root, ammoniacum, balsamum tolutanum and ether; the oil for jalap, rhubarb, castor-oil and squill; and the root for Jamaica sarsaparilla.

Remarks.—The seeds are small, round, hard, striated, dark brown and about the size of a small mustard-seed. They are full of oil, and if crushed on paper, they break with a noise and leave on it an oily stain. Their kernel is white, minute and albuminous. The fixed oil yielded by these seeds on expression is quite tasteless with little or no smell, and its color is pale amber, or yellowish or reddish-brown. The oil gives an orange red color with nitric acid. The root is small, fusiform, brown externally, pale-white internally and odorless with a slight bitterish taste.

I have used the seeds of *A. mexicana* in many cases and found them to possess all the medicinal properties I have described above. The largest dose of the seeds I have used is two drachms and a half, and even in so large a dose as this there was nothing in their action to lead to the suspicion of their being a narcotic as is generally supposed. It is difficult to account for such supposition without suspecting that some other seeds were confounded with them. I have, therefore, described the latter as minutely as I could, and if due attention is paid to this description there will be no difficulty in distinguishing them from all other seeds. Although the doses of the seeds of *A. mexicana* are very large, yet this is no disadvantage, because they are always used in emulsion, which is tasteless and can be sweetened, if necessary, as already explained. The emulsion is much liked by the patients.

There is also a great difference in opinions as to the action and dose of the oil of *Argemone mexicana*. Some say that thirty minims of it act as an efficient cathartic, while others consider it to be quite inert and incapable of producing any purgative effect in "ounce doses." I have got this oil prepared three or four times in my own presence and tried it in many cases. The former opinion is quite correct, and with regard to the latter, it is necessary to say that the oil, so far from being inert in "ounce doses," is unsafe in more than forty minim doses, and produces a dangerous hypercatharsis when the dose is increased to one drachm. If the oil is fresh, its average dose is twenty-five minims; and if old, thirty-five. It is a good drastic or hydragogue cathartic in such doses, and generally produces from 5 to 12 motions. Its advantage over jalap, rhubarb, castor-oil, &c., is the smallness of its dose; and over the croton oil, its freeness from unpleasant, nauseous and acrid taste. Its disadvantages as a purgative are, firstly, that its action is not uniform even in its average dose, which produces more than fifteen or sixteen motions at one time, and only three or four at another; and, secondly, that it is generally accompanied by vomiting at the commencement of its operation. Though the latter is not severe, yet it is a very unpleasant effect in a purgative medicine. Hypercatharsis from the use of this oil is not generally attended with great debility and other dangerous symptoms frequently observed under a similar condition from croton oil and some other purgatives.

FUMARIACEÆ.

‡ **Fumaria officinalis,** *Linn.* **47.**

‡ **Fumaria parviflora,** *Lam.* **48.**

Habitat.—Generally found in paddy-fields in many parts of India.

Part Used.—The whole plant except the root **(Nos. 47** and **48).**

Synonyms.—Shátrá, *Duk.* Pitpápará, *Hind.* Sháhtrah, *Pers.* Sháhtraj. or Baqlatul-malik, *Arab.* Turá, *Tam.*

Local Sources.—Found in many large bazaars of India.

Price.—Wholesale, Rs. 7 to 9 per maund; retail or bazaar, As. 6 to 8 per pound.

Physiological Actions.—Alterative tonic, diaphoretic and febrifuge.

Active Principle.—The plant contains fumaric acid and fumarine. Its physiological action is due to the latter.

Therapeutic Uses.—Useful in many slight cases of simple, idiopathic and uncomplicated fever, and in acute rheumatism, skin diseases and secondary syphilis.

Preparation.—Decoction, prepared as follows:—Take of the leaves and thin branches, three ounces; water one pint and a half; boil on a very slow fire till the liquid is reduced to one pint, and strain when cool.

Dose.—From two to three ounces, three times a day.

European Drugs for which it may be substituted.—Sassafras, Jamaica sarsaparilla, guaiacum wood, mezereon root and Pulv. Jacobi vera.

Remarks.—This drug generally acts more satisfactorily when used together with other medicines of the same class, and is therefore an ingredient in some prescriptions which will be mentioned hereafter under *Viola odorata, &c.*

CRUCIFERÆ.

* **Brassica alba,** *H. f.* and *T.* **(Sinapis alba,** *Linn.***) 49.**

Habitat.—Cultivated in some parts of India.

Part Used.—The seeds.

Synonyms.—White mustard, *Eng.* Suféd-rái or Suféd-ráyán, *Hind.* and *Duk.* Vellai-kaḍugu, *Tam.* Tella-áválu, *Tel.* Vella-katuka, *Malyal.* Biḷi-sásave, *Can.* Dhóp-rái, *Beng.* Shvéta-sarshaphaha, *Sans.* Pandhoramoharé, *Mah.* Ujlo-ráyí, *Guz.* Suddu-abbé, *Cing.* Sipandáne-supíd, *Pers.* Ḳhardale-abyaz, *Arab.*

Local Sources.—Met with in some large bazaars of Southern India.

Price.—Wholesale, Rs. 7 per maund; retail or bazaar, As. 7 per pound. Of the mustard-flour imported from Europe—Wholesale, Rs. 5 per dozen bottles; retail or bazaar, As. 10 per bottle.

Physiological Actions.—Internally, emetic and carminative; externally, rubefacient and vesicant.

Therapeutic Uses.—The mustard-flour imported from Europe is commonly met with in many large bazaars of Southern India, and is a very safe and speedy emetic, well suited in all cases of drunkenness and loaded stomach, where it is desirable to empty that organ immediately and producing a depressing influence on the system. In small quantities, taken with food, it improves digestion and promotes appetite. Locally, in the form of a poultice, it is a ready, speedy and successful remedy in many cases of neuralgic, spasmodic and rheumatic affections. It relieves the congestion and pain of internal organs if applied over their regions; hence the frequent and often great relief experienced in the congestive pain of the liver, stomach and heart, from its application over the hepatic, epigastric and cardiac regions, respectively.

Preparations.—Powder and poultice-powder: The mustard seeds in this country can never be reduced to such a fine powder as the mustard-flour imported from Europe. The latter, as I said before, is very common in many large bazaars of India, and it is therefore generally resorted to for preparing sinapism, even by natives. The powder of the mustard seeds in this country is extremely inferior to it. Poultice: I have almost always prepared the mustard-poultice or sinapism by mixing the mustard-flour with warm or tepid water, and making it soft enough to be easily spread over on cloth, without any linseed-meal or rice-flour. I found its action very satisfactory, and generally caused much pain in 5 or 6 minutes, and produced sufficient redness in 2 or 3 more.

Dose.—As an emetic, one ounce or a table-spoonful; and as a carminative, from grains twenty to a drachm.

European Drug for which it may be substituted.—For the mustard-flour imported from Europe.

‡ Brassica campestris, *Linn.* (Sinapis glauca, *Roxb.*) 50.

Habitat.—Cultivated in many parts of India.

Parts Used.—The seeds and oil.

Synonyms.—Rape, *Eng.* Sarsón, *Hind.* Baṛé-ráyán, *Duk.*

Local Sources.—Is often found in the bazaars of Southern India.

Price.—Wholesale, Rs. 4 per maund; retail or bazaar, As. 4 per pound.

Physiological Actions, Therapeutic Uses, Preparations, Doses and European Drugs for which it may be substituted.—See remarks under the corresponding headings in the preceding article.

* Brassica juncea, *H.f.* and *T.* (Sinapis juncea, *Linn.*) 51 and 52.

Habitat.—Cultivated all over India.

Parts Used.—The seeds **(No. 51)** and oil **(No. 52)**.

Synonyms.—Of the seeds—Indian mustard, *Eng.* Rái, *Hind, Beng.* and *Guz.* Ráyán, *Duk.* Kaḍugu, *Tam.* Áválu, *Tel.* Katuka, *Malyal.* Sásve, *Can.* Sarshaphaha, *Sans.* Moharé, *Mah.* Abbé, *Cing.* Munniyén-zi, *Bur.*

Local Sources.—The seeds are one of the commonest drugs in the Indian markets, and the oil is also sold in many bazaars.

Price.—Of the seeds—Wholesale, Rs. 10 per maund; retail or bazaar, As. $1\frac{1}{4}$ per pound. Of the oil—Wholesale, Rs. $4\frac{1}{2}$ per 12 half-pint bottles; retail or bazaar, As. 7 per one half-pint bottle.

Physiological Actions, Therapeutic Uses, Preparations, Doses and European Drugs for which they may be substituted.—See remarks under the corresponding headings under *Brassica alba.*

* Brassica nigra, *Koch.* (Sinapis nigra, *Linn*). 53.

Habitat.—Cultivated in some parts of India.

Part Used.—The seeds.

Synonyms.—Black or true mustard, *Eng.* Kálí-ráí or Kálé-ráyán, *Hind.* and *Duk.* Karuppu-kaḍugu, *Tam.* Nalla-áválu, *Tel.* Karuppa-kaṭuka, *Malyal.* Kappu-sásve, *Can.* Kál-ráí, *Beng.* Kálá-sarsha-phaha, *Sans.* Kála-mohare, *Mah.* Kála-ráí, *Guz.* Kalu-abbé, *Cing.* Amé-munniyén-zi, *Bur.*

Local Sources.—Found in some large bazaars of Southern India.

Price.—Wholesale, Rs. 2 per maund; retail or bazaar, As. 2 per pound.

Physiological Actions, Therapeutic Uses, Preparations, Doses and European Drugs for which it may be substituted.—Precisely the same as those described under White mustard (*Brassica alba*).

‡ Lepidium sativum, *Linn.* 54.

Habitat.—Cultivated in some parts of India.

Part Used.—The seeds.

Synonyms.—Common cress, *Eng.* Halím, *Duk.* Hálim, *Hind.*, *Beng.* and *Guz.* Áḷivirai, *Tam.* Áḍeli or Áḍiyálu, *Tel.* Ḥubburrashád, *Arab.* Tu*kh*meturrahtékak, *Pers.*

Local Sources.—Procurable in every large bazaar of India.

Price.—Wholesale, Rs. 3 per maund; retail or bazaar, As. 3 per pound.

Physiological Actions.—Internally, demulcent and gentle astringent; and externally, rubefacient.

Therapeutic Uses.—Useful in dysentery and dysenteric diarrhœa, and also in febrile and catarrhal affections. Externally, it is of great service in all the diseases in which the mustard is resorted to. The thick and very gummy mucilage of the seeds acts as a mechanical antidote in cases of poisoning by irritant substances, enveloping the poisonous particles and sheathing the mucous membrane of the stomach and intestines.

Preparations.—The seeds can be swallowed with water, entire or in coarse powder, and taken in the form of mucilage or decoction. The mucilage is prepared by simply bruising and rubbing the seeds with cold water. It is very thick and gummy; white if it is passed through

muslin, but reddish white if not strained, owing to the presence of the red particles of the cuticle of the seeds. The cuticle itself being soft and mucilaginous, there is no need for its separation by straining the mucilage. The decoction of the seeds is thus prepared:—Take of the seeds, bruised, six drachms; liquorice root, cut into small pieces and bruised, one drachm; water, one pint and a quarter; boil for 10 minutes in a covered vessel and strain when cool.

Doses.—Of the seeds, from one to two drachms and a half; and of the decoction, from one to three fluid ounces; three or four times in the twenty-four hours.

European Drugs for which it may be substituted.—For the mustard, tragacanth and gum-arabic imported from Europe.

Remarks.—The seeds are small, red or reddish-brown; elliptical, oval or oblong; about one line in length and half of that in thickness; taste mucilaginous and slightly pungent when chewed and swallowed, and their smell is slight, peculiar and not unpleasant.

It is a mistake to ascribe any purgative property to these seeds. I have used them in more than two-drachm doses for other purposes and never observed them to act on the bowels on any occasion. The best medical property of this drug, according to my own experience, is its usefulness in dysentery and dysenteric diarrhœa. The coarse powder and the thick and very gummy mucilage of the seeds appear to be well suited to allay the irritation of the mucous coat of the intestines in those diseases, and they thus relieve or check their symptoms to a considerable extent. The coarse powder or mucilage, of course, is not always sufficient to complete a cure by itself, but like many other remedies in dysentery, requires the assistance of some other medicines according to the circumstances of each individual case. The entire seeds swallowed with water have also some control over the above-named diseases, in consequence of their property of becoming soft and mucilaginous when moistened; but much less efficacious in this respect than their powder or mucilage.

As a rubefacient the seeds of *Lepidium sativum* are a better drug than mustard seeds, if both are employed under similar circumstances, *i.e*, when they and the mustard seeds are bruised separately with water and applied to two different parts of the body, their action is generally felt sooner and is stronger than that of the latter. These seeds, however, are very inferior to the mustard-flour imported from Europe, because they cannot be pulverized so well by ordinary means, but if they are so, there is no doubt in my mind that they will be much superior even to the European drug. Their action, again, is much increased if bruised with hot water, vinegar or lime juice instead of cold water.

‡ Raphanus sativus, *Linn.* 55.

Habitat.—Cultivated in every part of India.

Parts Used.—The seeds **(No. 55)** and root.

Synonyms.—Of the seeds—Radish seeds, *Eng.* Múlí-ké-binji, *Hind.*, *Duk.* and *Beng.* Mullángi-virai, *Tam.* Mullangi-vittulu, *Tel.* Moulázi, *Burm.* Bizrul-fujl, *Arab.* Tukh me-turb, *Pers.* Of the root—Radish,

Eng. Múlí, *Hind.*, *Duk.* and *Beng.* Mulḷángí, *Tam.* Mullangi, *Tel.* Moulá, *Burm.* Fujl, *Arab.* Turb, *Pers.*

Local Sources.—The seeds are sold in every large bazaar and the fresh root is procurable in every town and village of India.

Price.—Of the seeds—Wholesale, Rs. 3 per maund; retail or bazaar, As. 3 per pound. Of the root—Wholesale, Re. 1 per maund; retail or bazaar, Ps. 6 per pound.

Physiological Actions.—The root is stimulant-diuretic, stomachic and antilithic; and the seeds demulcent-diuretic. In full and repeated doses the seeds sometimes produce vomiting, but this is so rare that they cannot be considered as an emetic. They possess no other physiological action.

Therapeutic Uses.—The juice of the radish is useful in dysuria and strangury, and also in some slight cases of ischuria and calculus in the bladder. Eaten before a meal occasionally, the radish improves appetite and increases the digestive power. The dry seeds of the radish are also useful in some slight cases of dysuria and strangury, but their action is rather uncertain and irregular.

Preparations.—The juice of the radish is to be pressed out through cloth by bruising it without water. The seeds are used in the form of a draught by bruising and rubbing them with water and straining the liquid through cloth.

Doses.—Of the juice, from one ounce and a half to three fluid ounces, repeated frequently till the desired effect is produced; of the seeds, from one to two drachms.

European Drugs for which they may be substituted.—Spiritus ætheris nitrosi, horseradish-root and Spiritus ammoniæ aromaticus.

Remarks.—The root of this plant or radish requires no description. The seeds are roundish, reddish-grey or reddish-brown, vary in diameter from a half to one line, odorless and mucilaginous in taste.

CAPPARIDEÆ.

† Gynandropsis pentaphylla, *DC.* 56, 57 and 58.

Habitat.—One of the common weeds in gardens and fields.

Parts Used.—The seeds **(No. 56)**, leaves **(No. 57)** and roots **(No. 58)**.

Synonyms.—Of the seeds—Hurhur-ké-bínj, *Hind.* Hulhul-ké-bínj, *Duk.* Véḷai-virai, *Tam.* Vaminṭa-vittulu, *Tel.* Véḷa-bíjam, *Malyal.* Hurhuriyá-bíj, *Beng.* Of the leaves—Hurhur-ká-pát, *Hind.* Hulhul-ké-patté, *Duk.* Véḷai-ilai, *Tam.* Vaminṭa-áku, *Tel.* Véḷa-ela, *Malyal.* Hurhuriyá-páta, *Beng.* Of the root—Hurhur-kí-jaṛ, *Hind.* Hulhul-kí-jaṛ, *Duk.* Véḷai-vér, *Tam.* Váminṭa-véru, *Tel.* Véḷa-véra, *Malyal.* Hurhuriyá-múl, *Beng.*

Local Sources.—The seeds are sold in some large bazaars of Southern India, but the leaves and roots require to be gathered, which is done easily, the plant being found everywhere.

Price.—Of the seeds—Wholesale, Rs. 1½ per maund; retail or bazaar, As. 1½ per pound.

Physiological Actions.—The seeds are anthelmintic and rubefacient; the leaves a remedy for a few diseases of the ear; and the root a febrifuge.

Therapeutic Uses.—The seeds are employed internally for the expulsion of round-worms; and externally, their application to the skin is attended with relief in all the cases in which mustard is indicated. The juice of the leaves is often used by natives for the relief of otalgia and otorrhœa, and occasionally with success; but the burning sensation it produces in the ear, particularly in cases of the latter disease, is a drawback to its employment. The root has been observed to be useful in some mild cases of fever.

Preparations.—The seeds are prescribed internally in powder, which should always be used with sugar; and externally, in the form of a poultice or paste, by bruising them with vinegar, lime-juice or hot water. The root is employed in decoction, prepared thus :—Take of the root, cut into small pieces and bruised, three ounces; water, one pint and a half; boil on a slow fire till the liquid is reduced to one pint, and strain when cool. For the use of the ear, the juice of the leaves is to be pressed out by bruising them without water..

Doses.—Of the powder, from thirty grains to one drachm, with sugar, morning and evening for two days, and followed on the third morning by a dose of castor oil. For children the dose is from five to twenty grains, according to their age. Of the decoction, from one to three fluid ounces, four or five times a day.

European Drugs for which they may be substituted.—The seeds for the mustard imported from Europe, and for santonin; the leaves for glycerine; and the root for Pulv. antimonialis.

Remarks.—The leaves of *G. pentaphylla* are neither distinctly rubefacient nor possess a scent resembling that of asafœtida, as is generally supposed; but those of *Cleome viscosa*, a species of the same Natural Order, are endowed with the above characters to a considerable extent. These plants are often confounded with each other, the causes of which, as well as a few botanical characters by which they may be easily and readily distinguished, I have explained in my remarks under *C. viscosa*.

Although *Gynandropsis pentaphylla* and *Cleome viscosa* are species of two different genera, yet their seeds are alike, there being no distinct difference between their physical and medical properties, or, if any at all, it is only in the strength of their action, which is in favor of the seeds of the latter plant. This is very strange, and I am not aware of another example of this kind in Botany. I refer the reader for the description of the seeds of both plants and for some other information connected with them, to *C. viscosa* **(No. 61).**

† Cratæva religiosa, *Forsk.* 59 and 60.

Habitat.—Found in many gardens and fields in Southern India.

Parts Used.—The bark **(No. 59)**, leaves **(No. 60)** and root-bark.

Synonyms.—Of the bark—Barmé-kí-chhál, *Duk.* Mávalingam-pattai, *Tam.* Mávalingam-paṭṭa, *Tel.* Of the leaves—Barmé-ké-patté, *Duk.* Mávalingam-ilai, *Tam.* Mávalingam-áku, *Tel.* Of the root

bark—Barmé-kí-jaṛ-kí-chhál, *Duk.* Mávalingam-vér-paṭṭai, *Tam.* Mávalingam-véru-paṭṭa, *Tel.*

Local Sources.—The bark is sold in some large bazaars of India, but not the leaves and root-bark.

Price.—Of the bark—Wholesale, Rs. 2 per maund; retail or bazaar, As. 2 per pound.

Physiological Actions.—The bark is demulcent, antipyretic, sedative and alterative-tonic; and the fresh leaves and root-bark are rubefacient.

Therapeutic Uses.—The bark is useful in some cases of urinary complaints and fever, and in some mild forms of skin diseases in which sarsaparilla is generally resorted to. It also relieves vomiting and other symptoms of gastric irritation. The fresh leaves and root-bark, particularly the former, are very efficacious in all the affections in which mustard poultice is indicated.

Preparations.—Of the bark—Decoction, prepared by bruising and boiling four ounces of the bark with one pint and a half of water till the liquor is reduced to one pint, and strained when cool. The fresh leaves and root-bark are used separately in the form of a poultice or paste by bruising them with vinegar, lime-juice or hot water.

Dose.—Of the decoction, from two to four ounces.

European Drugs for which they may be substituted.—The leaves and root-bark, for the mustard imported from Europe; and the bark, for Jamaica sarsaparilla, Pareira root, Hydrocyanic acid and Pulv. antimonialis.

Remarks.—Bruised well with a little vinegar, lime-juice or hot water and applied to the skin in the form of a poultice or paste, the fresh leaves of *C. religiosa* act as a rubefacient and vesicant so efficiently that I do not hesitate in saying that they are not only much superior to the mustard seeds in this country, but also quite equal, if not superior, to the flour of that drug imported from Europe. From 5 to 10 or 15 minutes is the time required for them to produce their full effect as a rubefacient, and if kept longer than this in contact with the skin they begin to act as a vesicant. The existence of one or two plants of *C. religiosa* in each Hospital and Dispensary will certainly save them from the cost of the supply of Europe mustard for external use. The plant grows well with ordinary care.

The fresh root-bark of this plant is also a very good rubefacient and vesicant, but it is rather too dear and not procurable in large quantities. The bark of the stem is very thick (from 1 to 2 inches when fresh, and from ½ to 1 inch when dry), greenish brown on the outer side and grey or pale-white internally and on the inner side, and almost tasteless and odorless. It is one of those barks which can be easily reduced to a coarse powder immediately after its removal from the stem.

‡ Cleome viscosa, *Linn.* (C. icosandra, *Linn.* Polanisia icosandra, *W. et. A*). 61.

Habitat.—One of the commonest weeds in fields, particularly those of Indigo.

Parts Used.—The seeds **(No. 61)** and leaves.

Synonyms.—Of the seeds—Janglí-hurhur-ké-bínj, *Hind.* Chhórí-ajván or Jangli-hulhul-ké-bínj, *Duk.* Náy-véḷai-virai or Káṭṭu-kaḍugu, *Tam.* Kukká-váminṭa-vittulu, *Tel.* Náy-veḷa-bíjam, *Malyal.* Ban-hurhuriya-bíj, *Beng.* Of the leaves—Janglí-hurhur-ké-pát, *Hind.* Janglí-hulhul-ké-patté, *Duk.* Náy-véḷai-ilai, *Tam.* Kukké-váminṭa-áku, *Tel.* Náy-véḷa-ela, *Malyal.* Ban-hurhuriya-páta, *Beng.*

Local Sources.—The seeds are procurable in many large bazaars of Southern India, and the leaves can be easily obtained at the cost of collection. As the seeds of this plant and those of *Gynandropsis pentaphylla* are almost identical, as mentioned elsewhere, they are generally sold together in the bazaar indiscriminately. See their distinctions under the heading of "*Remarks.*"

Price.—Of the seeds—Wholesale, Rs. $1\frac{1}{4}$ per maund; retail or bazaar, As. $1\frac{1}{4}$ per pound.

Physiological Actions.—The seeds are anthelmintic, rubefacient, and vesicant; and the leaves rubefacient, vesicant and a remedy for a few diseases of the ear.

Therapeutic Uses.—The seeds are useful in expelling the round-worms, and also as a rubefacient and vesicant in all the complaints in which the mustard is used. The leaves are also useful in the same way, and in addition to this, their juice possesses a curative influence over some cases of otalgia and otorrhœa; but the smarting it produces in the ear, especially in the last-named disease, is an objection to its use.

Preparations.—Of the seeds—Used internally in powder with sugar, and externally in the form of a poultice by bruising with vinegar, lime-juice or hot water. Of the leaves—applied to the skin in the form of a poultice or paste by bruising them with vinegar, lime-juice or hot water; and their juice for the use of the ear is pressed out by bruising and rubbing them without water.

Doses.—Of the powder, from thirty grains to a drachm, twice a day for two days, and followed on the third morning by a dose of castor oil or some other purgative. For children the dose is from five to twenty grains according to their age.

European Drugs for which they may be substituted.—The seeds for santonin and for the mustard flour from Europe; and the leaves for the last-named drug and also for glycerine.

Remarks.—Although I have forgotten to send the leaves of this plant with my Collection of Drugs to Calcutta, yet they are, as a drug, much superior to those of *Gynandropsis pentaphylla.* It is the former (the leaves of *C. viscosa*) which possess a distinct fœtid smell and efficient rubefacient and vesicant properties, and not the latter. The above plants are frequently confounded with each other, partly from a general botanical similarity between them, and partly on account of their native synonyms being almost the same. Besides, the similarity of their seeds, which has already been explained under *G. pentaphylla*, adds greatly to this confusion There will be, however, no difficulty in

distinguishing them from each other if due attention is paid to the following botanical distinctions:—

Cleome viscosa.

Siliqua flat, striated, pubescent, and sessile or short-stalked; flowers yellow; stem and branches quite covered with viscid glandular hairs; smell very fœtid and strong. Seeds not so rough as those of Gynandropsis.

Gynandropsis pentaphylla.

Siliqua round, glabrous; stalk generally long and sometimes as long as the siliqua itself; flowers almost always white; stem and branches slightly covered with glandular hairs; smell fœtid, but generally very indistinct.

As the seeds of both of these plants are similar, I need not describe them separately. They are as follows:—Very small, being smaller than the poppy seeds; flat or slightly depressed and circular; dark or reddish brown in color; rough, inodorous, and slightly acrid and bitterish in taste. They yield a small quantity of fixed oil on expression. As a rubefacient and vesicant, the seeds under examination are much superior to the mustard seeds in this country, and quite equal to the mustard imported from Europe. If they can be reduced to so fine a powder as the European mustard, I think they will excel the latter also.

‡ Capparis horrida, *Linn.* 62 and 63.

Habitat.—Pretty common in Southern India.

Parts used.—The root-bark, root **(No. 62)** and leaves **(No. 63).**

Synonyms.—Bhagáṭí-kí-jaṛ or Bhaṭáṭí-kí-jaṛ, *Duk.* Ádanḍa-vér, *Tam.* Arudanḍa-véru, *Tel.*

Local Sources.—No part of this plant is sold in the bazaar, but the leaves and root can be obtained easily at the cost of collection. The root-bark, however, being very thin, it is rather difficult to procure it in a large quantity.

Physiological Actions.—Although I have included the root of this plant in my Collection of Drugs at Calcutta, yet it is the root-bark alone which can be used as a drug and not the whole root, which is generally very thick and woody. The root-bark is sedative, stomachic and anthidrotic; and the leaves also slightly stomachic.

Therapeutic Uses.—The root-bark is useful in relieving some of the symptoms of gastric irritation, as vomiting and pain, and in improving appetite. It has also proved itself useful in a few cases of excessive perspiration, which it checked to a great extent. The leaves also possess the property of improving the appetite.

Preparations.—Of the root-bark—Decoction, prepared by boiling four ounces of the root-bark with one pint and-a-half of water on a slow fire till the liquid is reduced to one pint, and strained when cool. Of the leaves—Decoction, prepared precisely in the same way as the above.

Doses.—Of the decoction of the root-bark as well as of the leaves, from one ounce to three ounces, 3 or 4 times in the 24 hours.

European Drugs for which they may be substituted.—The root-bark for Bismuthi subnitras and Acid. hydrocyanic. dil.; and the leaves for Dill fruit.

Remarks.—The leaves of *C. horrida* are very frequently used as a medicine by the natives of this country, but the root-bark is a much better drug according to my own experience, as already mentioned.

VIOLACEÆ.

‡ Viola odorata, *Linn.* 64.

Habitat.—Cultivated in gardens in some parts of India, partly as a drug, and partly as an ornamental plant on account of its small and beautiful blue or violet flowers.

Part Used.—The whole plant, including the root and flowers. The best season for collecting this plant is when it is in flower.

Synonyms.—Sweet Violet, *Eng.* Banafshah, *Pers.*, *Hind.* and *Duk.* Banafshah, *Arab.* Banosá, *Beng.* Banaphsá, *Guz.*

Local Sources.—Sold in all the large bazaars of India. Generally imported to Madras from Calcutta.

Price.—Wholesale, Rs. 14 per maund; retail or bazaar, As. 10 per pound.

Physiological Actions.—Antipyretic and diaphoretic.

Therapeutic Uses.—Very useful in relieving febrile symptoms and excitement in all forms of fever, as continued, remittent, typhoid, &c., particularly in combination with other drugs of the same nature, which I shall speak of under the heading of "*Remarks.*"

Preparations.—Compound and simple Decoctions. The compound decoction of *V. odorata* with many other drugs will be described under "*Remarks.*" The simple decoction is prepared by boiling two ounces and-a-half of the plant with one pint and-a-half of water, on a slow fire, till the liquor is reduced to one pint, and strained when cool.

Dose.—Of the simple decoction, from one to three fluid ounces.

European Drugs for which they may be substituted.—Warburg's Tincture, Liq. ammon. acet. and Pulv. Jacobi vera.

Remarks.—The dry *V. odorata* sold in the bazaar is a very small herb with thready branches; root small, fusiform, generally smooth, and from 1 to 3 lines in thickness; stem short, often divided and rough; leaves small, much shrivelled, but when moistened and spread they are elliptical or oblong; flowers very small, grey or yellowish white when old, and still retain their original blue or violet color when new. The root of *V. odorata* is never sold separately in Southern India, and it is so small that it will take several visses of the dry plant to get an ounce of it. The correct Persian synonym for this root will be Bikhe-banafshah, but according to a long-standing usage it is wrongly applied in the bazaar to a much larger root, which is the produce of a species of *Iris*, probably *I. ensata* or *I. florentina*.

If used alone, the action of *V. odorata* is not so satisfactory as when it is employed together with other drugs of the same class. This remark is applicable to every ingredient in the following prescription,

which may, for the sake of convenience, be called the compound decoction of *V. odorata*. This decoction is very useful in relieving the febrile excitement and other symptoms of pyrexia in obstinate and long-standing cases of continued, remittent, typhoid and typhus fevers. I have cured by this decoction two very obstinate and long-standing cases of typhoid fever, after the failure of all the European medicines generally in use. In one of them, the patient, a Hindu male about 35 years old, was suffering from the disease for more than 25 days before he came under my treatment, and then was getting worse gradually with a temperature permanently between 104° and 105° in the evening for about a fortnight more, when I began the use of the decoction as the last resource. On the second evening after its use, there was a distinct change for the better, the skin being moist with a fall of temperature by one decree for the first time, and in about 10 or 12 days more the patient was perfectly free from fever. During the employment of the decoction no other medicine was used, except a few doses of Dover's powder, which were necessary on one or two occasions to check diarrhœa. The second case is still more in favour of the decoction. The patient in this case was a young woman, and was labouring under a fever for more than a month. There was no doubt that the fever in this case was typhoid at the commencement, but the patient was distinctly in a typhous stage when placed under my care after the above period. Knowing how useful the decoction was from previous experience, I employed it at once in this case, and the great relief it afforded on the very first day was astonishing, not only to the parents of the child, but also to myself. The febrile symptoms were much relieved in 12 hours, and yielded completely in 2 or 3 days afterwards.

The decoction is still more useful in continued and remittent fevers, and there is no doubt that it will relieve pyrexia in many other forms of fever in which I have not yet tried it. The decoction is as follows:—

Take of *Viola odorata*, ℥ vi; seeds of *Cichorium Intybus*, *Lactuca sativa*, *Cucumis sativus*, *Cucumis Melo* and *Lagenaria vulgaris*, each ℥ iij; fruits of *Pimpinella Anisum* (aniseed), *Cordia Myxa*, *Cordia latifolia*, *Coriandrum sativum* (coriander) and *Zizyphus Jujuba*, each ℥ ij; berries of *Solanum indicum* and *S. nigrum* (either of them or an admixture of both), ℥ iiss; root of *Glycyrrhiza glabra* (liquorice root) and unexpanded flowers of *Rosa centifolia* (rose buds), each ℥ ij; and ripe and dried fruit of *Vitis vinifera* (raisins), ℥ iv; break and bruise all the seeds, fruits, roots and other hard substances, soak them in one pint of cold water for one or two hours, mix and squeeze with the hands for a minute or two, boil on a slow fire till the liquid is reduced to half of its quantity, and strain when cool. This decoction is to be used in 4 doses in the 24 hours, mixing with each dose one drachm of the watery extract of *Tinospora cordifolia* (satte-giló) immediately before it is taken by the patient. In cases of children and youths, the quantity of all the ingredients is to be reduced according to their age as follows:—

Age.	*Quantity to be reduced to*
Between 5 and 7 years	one-sixth
Do. 7 and 9 do.	one-fourth.
Do. 9 and 11 do.	one-third.
Do 11 and 13 do.	half.
Do. 13 and 15 do.	two-thirds.

The bowels are generally free under the use of this decoction, but if they are not so, or become costive in the course of treatment, the quantity of the liquorice root, rose-buds and raisins may be doubled or increased to such an extent as to produce the desired effect. On the other hand, if there is any looseness or diarrhœa, from whatever cause, they may be omitted altogether, and also, if necessary, a few grains of Dover's powder may be used in their stead with each dose of the decoction. If the fever does not yield to the decoction within a week, the quantity of each ingredient may be increased by half till it is doubled, according to the obstinacy and severity of the disease.

‡ **Ionidium suffruticosum**, *Ging.* (**Viola suffruticosa**, *Linn.*) **65.**

Habitat.—One of the commonest herbs in India, and grows abundantly in low and damp places.

Part Used.—The whole plant.

Synonyms.—Ratan-purus, *Duk.* Orilaittámarai, *Tam.* Suryákánti, *Tel.*

Local Sources.—Not sold in the bazaar, but can be gathered easily whenever it is necessary.

Price.—The cost of collection is very cheap.

Physiological Actions.—Demulcent, refrigerant, tonic and diuretic.

Therapeutic Uses.—Useful in some cases of gonorrhœa and scalding of urine.

Preparation.—Juice of the fresh leaves pressed out by bruising them with water, and administered alone or in combination with Fenugreek seeds.

Dose.—Dose of the leaves is one drachm, twice or three times a day.

European Drugs for which it may be substituted.—Oleum copaibæ and Spiritus ætheris nitrosi.

BIXINEÆ.

* **Gynocardia odorata**, *R. Br.* **66 and 67.**

Habitat.—Himalayas and Khasia Hills. Does not grow in Southern India.

Parts Used.—The seeds (**No. 66**) and oil (**No. 67**).

Synonyms.—Of the seeds—Chaulmugra seeds, *Eng.* Chávulmungrí or Chávul-mugrí-ké-bínj, *Hind.* Chánval-mógré-ké-bínj, *Duk.* Tukhme-brinj-mógrá, *Pers.* Of the oil—Chaulmugra oil, *Eng.* Chávulmungrí-ká-tél, *Hind.* Chánval-mógré-ká-tél, *Duk.* Róghane-brinj-mógrá, *Pers.*

Local Sources.—The oil is procurable at Madras, but not the seeds. The seeds in my Collection of Drugs (**No. 66**) are from Calcutta.

Price.—Of the oil—Wholesale, Rs. 5 per pound; retail or bazaar, As. 6 per ounce.

Physiological Actions.—Internally, alterative tonic in medicinal doses; but produces a severe irritation in the stomach and bowels in larger ones. Externally, stimulant.

Therapeutic Uses.—In true leprosy the Chaulmugra oil and seeds are a remedy of established value, and they are also very useful in some other skin diseases, including the secondary and tertiary syphilis, and in scrofula and phthisis pulmonalis.

Preparation.—The oil is best taken floating on water or milk, and the seeds can only be used in the form of pill or coarse powder.

Doses.—Of the oil, from five to fifteen minims or drops, or until it can be tolerated by the stomach and bowels. Of the seeds, from five to fifteen grains or more, gradually increased.

European Drugs for which they may be substituted.—Codliver oil, iodine and arsenic.

Remarks.—The oil of *Gynocardia odorata* or Chaulmugra oil is reddish brown and slightly viscid with a peculiar and nauseous smell and taste. It bears the greatest resemblance to croton oil in its appearance and smell. During the rainy and cold seasons, a portion of it congeals and is thrown down at the bottom of the bottle in the form of a grey or yellowish-white crystalline fat. This fat is liquified by heat. "The seeds, 1 to $1\frac{1}{4}$ inches long and about half as much in diameter, are of irregular ovoid form, and more or less angular or flattened by mutual pressure; they weigh on an average about 35 grains each. The testa is very thin (about $\frac{1}{50}$ of an inch), brittle, smooth, dull-grey; the copious oily albumen encloses a pair of large, plane, leafy, heart-shaped cotyledous with a stout radicle." (*Pharmacographia*, p. 71.)

The active principle of the oil is gynocardic acid which has been used in Europe in various forms of skin disease, both externally and internally. The acid rarely produces nausea, and is best administered in the form of a pill or *perle* containing half a grain to three grains for eczema.

The oil of *G. odorata* is the best of all the remedies in use for leprosy. The seeds of this plant are also useful in the same disease but to a less extent, and their use in sufficient quantity in the form of pill or powder is rather inconvenient. If the attack of the disease is slight and of short duration, the beneficial influence of the oil is remarkable and rapid; but if severe and of longstanding, no distinct improvement takes place until it is persisted in for months or years. It is useful in all the forms of leprosy (tubercular, anæsthetic and mixed), but the first-named variety is the one which is most benefited by it. The internal use of the oil should always be assisted by its external application to the affected parts. If used alone externally, it proves itself too strong in some cases and excoriates the tender and diseased parts or renders the ulcers irritable and painful. I have, therefore, generally employed it in combination with *Margosa oil* or the oil of *Pongamia glabra* in the proportion of one of the former to two or three of the latter. The Chaulmugra oil is also very useful in lepra-vulgaris, psoriasis, secondary and tertiary syphilis. I have recently tried it in some cases of phthisis pulmonalis and scrofula in combination with cocoanut oil, and with pretty good results. Mixed with cocoanut oil, it can be administered in much larger doses without any bad effect than when used alone. During the use of

this oil in leprosy the patient may be kept on a good and nourishing diet, but is prohibited from taking the following articles:—Fish, prawns, beef, brinjal, greens, curdled milk, lime juice and ardent spirits. See "*Remarks*" under *Dipterocarpus turbinatus*.

† Hydnocarpus Wightiana, *Bl.* (H. inebrians, *Wall.*) 68.

Habitat.—Malabar and some other parts of South India.

Parts Used.—The seeds (**No. 68**) and oil.

Synonyms.—Of the seeds—Janglí-bádám, *Duk.* Níraḍi-muttu, *Tam.* Níraḍi-vittulu, *Tel.* Raṭa-kekuna, *Cing.* Of the oil—Janglí-bádám-ká-tél, *Duk.* Níraḍi-muttu-eṇṇey, *Tam.* Níraḍi-vittulu-núne, *Tel.*

Local Sources.—The seeds are met with in every large bazaar of Southern India, but not the oil. The seeds abound in a fixed oil, and yield a large quantity of it on expression.

Price.—Of the seeds—Wholesale, Rs. 2½ per maund; retail or bazaar, As. 2 per pound.

Physiological Actions.—Alterative tonic and local stimulant.

Therapeutic Uses, Preparations, and European Drugs for which they may be substituted.—The same as those of the seeds and oil of *Gynocardia odorata*, the preceding article.

Doses.—Of the oil, from fifteen minims to two drachms, or, as much as can be borne by the stomach. Of the seeds, from fifteen grains to two drachms, gradually increased. In using the seeds internally, they should be chewed and the juice swallowed, but not the whole substance.

Remarks.—The seeds of *H. Wightiana* are about three-quarters of an inch long, half an inch broad and 3 to 4 lines thick; generally irregularly ovate and occasionally oval or oblong, with the upper end invariably more pointed than the lower; testa fragile and rough with coarse and irregular longitudinal striæ; kernel albuminous and oily with heart-shaped and three-nerved cotyledons; odorless, but possess a faint sweetish taste somewhat like that of almonds. Being generally irregular from mutual compression, these seeds bear a resemblance to those of *Gynocardia odorata*, but the smallness of their size and roughness from longitudinal striæ are sufficient to distinguish them from the latter, which are smooth and generally twice as large. The seeds of *H. Wightiana* yield 44 per cent. of fixed oil, on which their medicinal properties depend, and which is much more useful, satisfactory, and convenient as a drug than the seeds themselves. The oil is viscid and of a pale straw color without any particular taste or smell.

This oil is a good substitute for *Chaulmugra oil*, and proves useful in all the affections in which the latter is indicated. To ensure its best effects, however, it is required to be used in its full medicinal doses, which are from one to two fluid drachms when used alone, and much more than that if employed in combination with cocoanut oil. It being a very cheap oil, it may be used externally by itself, and not with any other cheaper oil, as is generally the case with *Chaulmugra oil*. The vernacular name of the tree signifies "Jungle almond."

† Cochlospermum Gossypium, *DC.* (Bombax gossypium, *Linn.*) 69, 70 and 71.

Habitat.—Some parts of South India, as Travancore and Coromandel. There are several trees in the gardens of Madras.

Parts Used.—The gum and cotton (silk-cotton).

Synonyms.—Of the gum—Nát-ká-katérá, Nát-ká-katérá-gónd, *Duk.* Hindí-katérá, *Hind.* Tanaku-pishin, *Tam.* Konḍa-gógu-banka, Konḍa-gógu-pisunu, *Tel.* Shíma-pangi-pasha, *Malyal.* Of the cotton—Píli-kapás-kí-rúi, Katéré-ké-jhár-kí-rúi, *Duk.* Tanaku-parutti, *Tam.* Konḍa-gógu-patti, *Tel.* Shíma-pangi-parutti, *Malyal.*

Local Sources.—The gum is pretty common in large bazaars of India, but the cotton is not sold, and therefore requires to be gathered. There are generally three varieties of this gum, known according to their color as white, red and brown or black. The white is the best, the black the worst, and the red, the intermediate variety, is employed for medicinal purposes.

Price.—Of the best or white variety of the gum **(No. 69)**—Wholesale, Rs. 5 per maund; retail or bazaar, As. 4 per pound. Of the second or red variety **(No. 70)**—Wholesale, Rs. 4 per maund; retail or bazaar, As. 3 per pound. Of the worst or black variety **(No. 71)**—Wholesale, Rs. 3 per maund; retail or bazaar, As. 2 per pound.

Physiological Actions.—The gum is demulcent and emollient. The cotton is a local remedy in some surgical cases, and also a useful article for preparing pads for splints, &c.

Therapeutic Uses.—The gum is useful in relieving some mild cases of catarrhal affections and of irritation of the genito-urinary organs. It is used sometimes as an adjunct to other medicines, chiefly for the purpose of suspending heavy powders, as the salts of bismuth, &c. As the gum imparts firmness to sugar and other substances when it is mixed with them with water and dried, it is very useful in making lozenges and some kind of pills.

Preparations and Doses.—Precisely the same as those described in the *Pharmacopœia of India*, page 76, under *Astragalus verus.*

European Drug for which the gum may be substituted.—For the Tragacanth imported from Europe.

‡ Bixa Orellana, *Linn.* 72 and 73.

Habitat.—A native of America. Cultivated throughout India for its red dye.

Parts Used.—The root-bark **(No. 72)** and seeds **(No. 73)**.

Synonyms.—Of the root-bark—Arnatto root-bark, *Eng.* Laṭkan-kí-jaṛ-kí-chhál, *Hind.* Shál-ké-panḍú-kí-jaṛ-kí-chhál, *Duk.* Jáfra-virai-vér-paṭṭai, Kurangu-múnjil-virai-vér-paṭṭai, *Tam.* Jáfra-vittulu-véru-paṭṭa, Kurungu-múnjil-vittulu-véru-paṭṭa, *Tel.* Of the seeds—Arnatto seeds, *Eng.* Laṭkan-ké-bínj, *Hind.* Shál-ké-panḍú-ké-bínj, *Duk.* Jáfra-virai, Kurangu-múnjil-viṛai, *Tam.* Jáfra-vittulu, Kurangu-múnjil-vittulu, *Tel.*

Local Sources.—The seeds are sold in the bazaars of Madras, but not the root-bark. The latter requires to be collected.

Price.—Of the seeds—Wholesale, Rs. 9 per maund; retail or bazaar, As. 8 per pound.

Physiological Actions.—The root-bark is antiperiodic and antipyretic, and the seeds slightly astringent and a very good remedy for gonorrhœa. The seeds also possess the antiperiodic and antipyretic properties, but to a less extent.

Therapeutic Uses.—The root-bark is of great use in uncomplicated intermittent, remittent, and continued fevers. The seeds are very useful in gonorrhœa, particularly in the form of decoction. They are also useful in the above varieties of fever, but inferior to the root-bark in this respect.

Preparations.—Of the root-bark and seeds—Decoction, tincture and simple powder. Decoction of the root-bark: Take of the root-bark, in coarse powder, six ounces; water two pints and a half; boil on a slow fire till the liquid is reduced to one pint, and strain when cool. Tincture of the root-bark: Take of the root-bark, in coarse powder, six ounces; proof spirit one pint; macerate for seven days with occasional agitation; strain and add more proof spirit to make one pint. Simple powder of the root-bark: The root-bark should be reduced to a fine powder in the ordinary way, passed through a sieve or cloth and kept in a well-corked bottle. Preparations of the seeds are the same and prepared in the same manner.

Doses.—The dose of the decoction of the root-bark is from two to four fluid ounces; of the tincture, from two to four fluid drachms; and of the powder from one to two drachms. The doses of the corresponding preparations of the seeds are the same.

European Drugs for which they may be substituted.—For Warburg's tincture and James' powder as an antipyretic; for quinine and other alkaloids of cinchona as an antiperiodic; and for copaiba as a remedy for gonorrhœa.

Remarks.—The root-bark of *B. Orellana* is one of those antiperiodic medicines, which can be used during the absence as well as the presence of pyrexia in the intermittent fever, and this remark is also applicable to the seeds as an antiperiodic.

The pulp surrounding the testa of the seed affords the Urucu pigment of Brazil, and the Arnatto or Annatto used in Europe for coloring butter, cheese and varnish. Its use in dyeng cloths is now superseded by the cheaper aniline dyes obtained from coal-tar.

PORTULACEÆ.

‡ Portulaca oleracea, *Linn.* 74 and 75.

Habitat.—Cultivated in every part of India.

Parts Used.—The seeds **(No. 74)** and leaves **(No. 75)**.

Synonyms.—Of the seeds—The common Indian Purslane seeds, *Eng.* *Khurfé-ké-bínj*, *Hind.* *Khulfé-ké-bínj*, *Duk.* Parpu-kíre-virai, *Tam.*

Pappu-kúra-vittulu, Pedda-pávila-kúra-vittulu, Goḍḍupávili-kúra-vittulu, *Tel.* Baṛó-loniyá-bij, *Beng.* Tu*kh*me-*kh*urfah, *Pers.* Bazrul-baqlatul-ḥumqá, *Arab.* Of the leaves or the whole plant—The common Indian Purslane, *Eng.* Ḳ*h*urfáh Ḳ*h*urfé-ká-ság, *Hind.* Ḳ*h*ulfé-kí-bhájí, *Duk.* Parpu-kíre, *Tam.* Pappu-kúra, Pedda-pávili-kúra, Goḍḍu-pavilikúra, *Tel.* Baṛo-lóniya, *Beng.* Ḳ*h*urfah, Turuk, *Pers.* Baq-latul-ḥumqá, *Arab.*

Local Sources.—The seeds are plentiful in every large bazaar of India, and the fresh plant being a common pot-herb is sold in every town and large village.

Price.—Of the seeds—Wholesale, Rs. 4 per maund; retail or bazaar, As. 3 per pound. The fresh leaves are very cheap, one pie worth will be sufficient for one or two doses.

Physiological Actions.—The seeds are demulcent, slightly astringent and diuretic; and the leaves refrigerant, astringent, diuretic and emollient.

Therapeutic Uses.—The seeds and leaves are very useful in some cases of strangury, dysuria, irritation of the bladder, hæmaturia, hæmatemesis, hæmoptysis and gonorrhœa. In addition to this, the seeds seem to have some beneficial influence over the mucous membrane of the intestinal canal, and therefore relieve tormina, tenesmus, and other distressing symptoms in many cases of dysentery and mucous diarrhœa. This is particularly the case when they are combined with some other drugs of similar nature, a prescription of which I shall give under the head of "*Remarks*" in the present article.

Externally, the use of the fresh succulent and fleshy leaves of *P. oleracea* is of great service in relieving pain and other symptoms of inflammation in all the affections (including erysipelas) in which ice or cold lotion is indicated. Bruised and applied in the form of a cold poultice, with or without water, they impart great coldness and thus relieve local inflammation.

Preparations.—The only form in which I have yet used the seeds is a draught, which is to be prepared by bruising and rubbing them with water and straining the liquid through cloth. The juice of the fresh leaves is also used as a draught after it is pressed out of the leaves previously bruised without water.

Doses.—Of the seeds, from thirty grains to one drachm; and of the juice of the leaves, from one to two fluid ounces.

European Drugs for which they may be substituted.—Spirit of nitrous ether, Pareira-brava, tragacanth, elm-bark, rhatany and copaiba.

Remarks.—The seeds of *P. oleracea* are very small, being about one-half smaller than those of *Cleome viscosa* and *Gynandropsis pentaphylla*. They are very black, smooth, flat or slightly depressed, circular and odorless, but possess a slight mucilaginous taste.

The following is the prescription of these seeds alluded to under the head of "*Therapeutic Uses*":—

Take, in coarse powder, of the seeds of *Portulaca oleracea*, ℥j; kernel of the seeds of *Cucurbita Pepo*, *C. Citrullus*, *C. maxima*, *Cucumis Melo*, and *C. sativus*, each ℥ss; gum of *Pterocarpus Marsupium* (gum-kino) and gall-like excrescences of *Terminalia chebula*, each grs. x; seeds of

Ocimum basilicum and *O. album*, each grs. xv; and dry starch of *Triticum sativum* ℥ss. Rub all the ingredients well in a mortar with two ounces of water and strain the liquid through cloth. Add to this draught four or five fluid drachms of the Syrup of Pomegranate (*Punica granatum*) and give to the patient four or five times in the twenty-four hours. The syrup of the sour pomegranate is the best, but in the absence of the syrup of both the sour and sweet pomegranate, the juice of either of them will do. If the seeds of *Cucurbita Pepo* are not readily procurable, they may be substituted by those of *Lagenaria vulgaris*, which, like all other ingredients in the prescription are very abundant in the bazaar. In some slight cases of dysentery and mucous diarrhœa, the seeds of *P. oleracea* alone with the syrup of pomegranate are sufficient to relieve griping, straining, &c.; but the combination of all other drugs in the prescription is indispensable in more severe and obstinate cases. In worst cases, however, the prescription is not enough to effect or complete a cure by itself, but requires the assistance of some other drugs, especially the preparations of opium.

The prescription under consideration is equally useful in children and youths. The quantity of its ingredients should be reduced according to their age in the same proportion as that explained in a tabular form in page 34. The whole plant is eaten in times of famine.

‡ Portulaca quadrifida, *Linn.* 76.

Habitat.—Cultivated in some parts of India, but generally found growing wild in many low, damp and marshy places, and along the wet nullas.

Part Used.—The fresh leaves or the whole plant.

Synonyms.—Chounláyí, Loniyá, *Hind.* Chounláyí-kí-bhájí, Ghól-kí-bhájí, *Duk.* Siru-parpu-kírai, Pasarai-kírai, Siru-pasarai-kírai, *Tam.* Sanna-pappu-kúra, Sanna-pávili-kúra, *Tel.* Baqlatul-yamániyah, Baqlatul-âarabbíyah, *Arab.* In Hyderabad the Arabic synonyms just mentioned are applied to a different plant.

Local Sources.—It being one of the pot-herbs much used by poor natives of this country, the fresh plant is frequently sold in all the towns and large villages.

Price.—The price of the fresh plant is much cheaper than that of the preceding one (*P. oleracea*).

Physiological Actions, Therapeutic Uses, Preparations, Doses, and European Drugs for which it may be substituted.—Precisely the same as those of the fresh leaves of *P. oleracea*.

TAMARISCINEÆ.

† Tamarix gallica, *Linn.* 77.

Habitat.—Grows along the rivers in many parts of India.

Parts Used.—The galls (**77**) and manna.

Synonyms.—Indian Tamarisk galls, *Eng.* Baṛí-máyín, *Hind.* Baṛí-máyí, *Duk.* Ṣamaraṭuṭ-ṭarfá, Ḥabbuṭ-ṭarfá, *Arab.* Gazmázaj, Gazmázak, Gazmázu, *Pers.* Of the manna—Ḳazánjabín, *Arab.* Gazangabín, *Pers.*

Local Sources.—The galls are common in all the large bazaars of India, but the manna is extremely rare. I was unable to get a real specimen of the manna of *T. gallica* for my Collection of Drugs at Calcutta from any place, and what had been sent to me under its name from Hyderabad and Bombay were samples of the manna of *Alhagi Mauroram* (Turanjabín), altered with some impurities.

Price.—Of the galls—Wholesale, Rs. 4 per maund; retail or bazaar, As. 3 per pound. Bombay Rs. 12 to 13 per maund of 37½ lbs.

Physiological Actions.—The galls are astringent on account of the tannic and gallic acids they contain, and the manna is considered to be laxative, expectorant and detergent, but I know nothing of the medical properties of the latter drug from my own experience.

Therapeutic Uses.—Internally, the galls are useful in some cases of diarrhœa, dysentery and leucorrhœa; and externally, in some forms of ulcers, such as the congestive, weak, foul, &c., and in hæmorrhoids.

Preparations.—Simple powder, decoction, simple ointment and ointment with opium. Reduction of the galls into simple powder requires no explanation. The decoction is thus prepared—Take of the galls, in coarse powder, two ounces and a half; water, one pint and a half; boil till the liquid is reduced to one pint, and strain when cool. Simple ointment: Take of the galls, in fine powder, two drachms; simple ointment, one ounce; and mix thoroughly. Ointment with opium: Take of the above simple ointment, one ounce; opium, in powder, thirty grains; and mix thoroughly.

Doses.—Of the simple powder, from thirty grains to one drachm; and of the decoction, from one to three fluid ounces.

European Drug for which the galls may be substituted.—Oak-galls.

Remarks.—The galls of *T. gallica* are roundish and very nodular, or knotty excrescences, varying in their size from a pea to a soap-nut. The knots are often so numerous and prominent with narrow necks that they give the gall the appearance of a cluster. The galls are generally greyish or yellowish brown in colour. The quantity of the tannic and gallic acids they contain is smaller than that in oak galls, and their action is consequently somewhat weaker than that of the latter.

† Tamarix articulata, *Vahl.* (T. orientalis, *Forsk.*) 78 and 79.

Habitat.—Grows in the same kind of localities as the preceding species of *Tamarix*, but appears to be less abundant.

Part Used.—The galls.

Synonyms.—*Chhóṭí*-máyín, Nahní-máyín, *Hind.* *Chhóṭí*-máyí, Nahní-máyí, *Duk.* Ḥabbul-aṣl, Ṣamartul-aṣl, âazbah, *Arab.* Gazmázaje-*Ḳhurd*, Máyíne-*Ḳhurd*, *Pers.*

Local Sources.—The galls of *T. articulata* are extremely rare; so much so, that they are not met with in Madras, but what are sold under

their names here are the small and young excrescences picked out from the galls of *T. gallica*. The sample of the galls of *T. articulata* in my Collection of Drugs at Calcutta (**No. 78**) is genuine, but very old, it being bought in Arabia about 15 years ago. **No. 79** is a doubtful variety of the same drug from Hyderabad.

Price.—Of the doubtful variety—Wholesale, Rs. 3 per maund; retail or bazaar, As. 4 per pound.

Physiological Actions, Therapeutic Uses, Preparations, Doses and European Drugs for which they may be substituted.—The same as those of the galls of *T. gallica*, the preceding article.

Remarks.—The chief difference between the galls of *T. articulata* and those of *T. gallica* is, that the former are much smaller, being generally about the size of a pea.

GUTTIFERÆ.

***Garcinia Morella,** *var.* pedicellata, *Hanb.* (**G. Hanburii,** *Hook.*) **80.**

Habitat.—Eastern Peninsula and Siam, Khásia Hills, and East Bengal.

Part Used.—The gum resin.

Synonyms.—Siam gamboge, *Eng.* Gomme Gutte, Gummigutt, *Fr.* Ghótágḥanbá, *Hind.* Rubbe-révand, âuṣárahe-révand, Farfirán, *Arab.* Auṣárahe-révan, Gótáganbá, *Duk.*

Local Sources.—The Siam gamboge is procurable in every large bazaar of India.

Price.—Wholesale, Rs. 1-4-0 per pound; retail or bazaar, As. 2 per pollum.

Physiological Actions.—Hydragogue and drastic cathartic, and anthelmintic, due to the resin.

Therapeutic Uses.—Very useful in relieving constipation and also in some cases of dropsical affections. Round and thread worms are sometimes seen expelled under its use, but this is so rare that it hardly deserves the name of anthelmintic.

Preparations.—Compound gamboge powder and pill. Compound gamboge powder: Take of Siam gamboge in powder, three drachms; cream of tartar, in powder, three ounces and one drachm; ginger, in powder, two drachms. Mix and rub them well together and pass the powder through a fine sieve. Compound gamboge pill: Take of gamboge, Barbadoes or Indian aloes and compound powder of cinnamon, each one ounce; hard soap, in powder, two ounces; syrup, a sufficiency. Pulverise the gamboge and aloes separately, mix them with the cinnamon powder, and then with the syrup, and beat the whole into a uniform mass. (*Pharmacopœia of India*, p. 30).

Doses.—Of the compound gamboge powder, from forty grains to one drachm; and of the compound gamboge pill, from five to ten grains. The compound gamboge powder can be used in youths and children in smaller doses according to their age, but contra-indicated in pregnant women. One drachm of this powder contains six grains of gamboge, fifty grains of cream of tartar, and four grains of ginger. There is one grain of gamboge in every ten grains of the powder.

European Drugs for which it may be substituted.—Jalap and scammony.

Remarks.—The Siam gamboge is well described in the *Pharmacographia*, pp. 78 and 79, and in the *Pharmacopœia of India*, p. 30. It is one of the best purgatives in India and a much stronger drug than jalap. Like the latter, it acts very satisfactorily in combination with other purgatives or laxatives, but not so when employed alone. During the last 20 years I have used this medicine in Triplicane Dispensary with cream of tartar whenever jalap was out, and never felt the want of the latter. The cheapness and abundance of Siam gamboge in India are other advantages of it over jalap. The compound powder of Siam gamboge is a very useful preparation, and it is more efficient and satisfactory and less unpleasant than the corresponding preparation of both jalap and kálá-dánah (*Ipomæa hederacea*).

* Garcinia Morella, *var.* pictoria, *Roxb.* 81.

Habitat.—Mysore, Canara, Wynaad forests and Malabar Coast.

Part Used.—The gum resin.

Synonyms.—Mysore gamboge, *Eng.* Mysúrí-*gẖótá-gẖ*anbá, *Duk.*

Local Sources.—Although the plant is pretty common in all the places mentioned above, yet the gum resin is very rare. The latter is either not extracted much, or, if it is so, not exported to other places. It is never met with in the bazaars of Madras. Having failed in obtaining a genuine specimen of this article (Mysore gamboge) on former occasions of collecting drugs, and knowing what is sold under its name in many places is Siam gamboge, imported from Camboja through Bankok, Singapore, &c., I was determined to get it for the Calcutta International Exhibition. I therefore commenced the work of my present Collection first by trying to procure the Mysore gamboge, and wrote to many persons at Mysore, Bangalore, Tellicherry, Calicut, Bombay, &c., but did not succeed in my efforts until the end of the seventh month. All the specimens sent to me from the above places were wrong, they being for the most part Siam gamboge and in some instances yellow orpiment or some yellow coloring stuff. The place from which after all I did get the real drug **(No. 81)** was Cannanore.

Physiological Actions, Therapeutic Uses, Preparations, and European Drugs for which it may be substituted.—Similar to those of the preceding drug (Siam gamboge).

Doses.—In every preparation the dose of Mysore gamboge is somewhat larger than that of the Siam.

Remarks.—The Mysore gamboge occurs in masses of various shapes and sizes, instead of cylindrical pieces, and there is very little difference between the physical and chemical characters of this drug and those of Siam gamboge. The former, however, as a drug, is much inferior to the latter, as it is collected in a very rough way, and generally contains sticks, leaves, stones and other impurities. I have used both these medicines in many cases under similar circumstances as to age, sex, &c., and found that Mysore gamboge requires to be used in much larger doses than those of the Siam article to produce the same effect.

This is one of the reasons of my treating the Mysore gamboge separately under the head of *G. pictoria* as a variety of *G. Morella*.

* Garcinia Indica, *Chois.* (G. purpurea, *Roxb.*) 82.

Habitat.—Forests of Malabar, the Konkan and Goa.

Part Used.—The concrete oil and dried fruit.

Synonyms.—Kokum butter, *Eng.* Kokum-ká-tél, *Hind.* Dhúpadi-enné, *Can.*

Local Sources.—Not found in Madras, but requires to be sent for from distant places, as Goa, Bombay and Cannanore. The specimen **(No. 82)** in my Collection is from Bombay.

Physiological Actions.—Demulcent, nutrient and emollient.

Therapeutic Uses.—Useful in phthisis pulmonalis and some scrofulous diseases, and in dysentery and mucous diarrhœa. I have no personal experience of its external use, but it is said to be of great service in ulcerations and fissures or cracks of the feet, hands and lips, if melted and applied to the affected parts. From its soft and thick consistence it will likely constitute the basis of simple and several other ointments.

Preparations.—Used in substance with or without sugar.

Doses.—As a nutrient or remedy for phthisis pulmonalis and scrofulous diseases, from half to one ounce, or more; and as a remedy or adjuvant to other medicines in dysentery and mucous diarrhœa, from one to two drachms.

European Drugs for which it may be substituted.—Cod liver and fish oils, cetaceum and wax.

Remarks.—A very good and graphic description of kokum butter occurs in the *Pharmacographia*, p. 80, which is as follows:—

"Kokum butter is found in the Indian bazaars in the form of egg-shaped or oblong lumps about 4 inches long by 2 inches in diameter, and weighing about a quarter of a pound. It is a whitish substance, at ordinary temperatures, firm, dry, and friable, yet greasy to the touch. Scrapings (which are even pulverulent) when examined in glycerine under the microscope show it to be thoroughly crystalline. They have a mild oily taste, yet redden litmus if moistened with alcohol.

"By filtration in a steam bath, kokum butter is obtained perfectly transparent and of a light straw color, concreting again at 27·5° C. into a white crystalline mass: some crystals appear even at 30°. Melted in a narrow tube, cooled, and then warmed in a water bath, the fat begins to melt at 42·5° C., and fuses entirely at 45.° The residue left after filtration of the crude fat is inconsiderable, and consists chiefly of brown tannic matters soluble in spirits of wine.

"When kokum butter is long kept it acquires an unpleasant rancid smell and brownish hue, and an efflorescence of shining tufted crystals appears on the surface of the mass." Stearic, myristic, and oleic acids have been separated from the fat.

I have used *Kokum butter* internally in my practice and found that its best medical properties are its usefulness in phthisis pulmonalis and some scrofulous diseases, and in dysentery and mucous diarrhœa. In

the former (phthisis pulmonalis), its action is something like that of cod liver oil, of which it is a pretty good and very cheap and pleasant substitute; and, in the latter (dysentery) it is of great service in relieving *tormina* and *tenesmus* when employed as an adjuvant to other medicines.

The fruit is used as an acid ingredient in curries. It is freed from seeds, sliced and dried in the sun. As a medicine, antiscorbutic properties are attributed to it.

† Calophyllum inophyllum, *Linn.* 83.

Habitat.—Being an ornamental plant, it is found in many gardens of Madras and other parts of Southern India.

Parts Used.—The seeds (**No. 83**) and oil.

Synonyms.—Of the seeds or fruits—Alexandrian laurel seeds, *Eng.* Surpan-ké-bínj, *Hind.* Surfan-ké-bínj, *Duk.* Punnai-koṭṭai, *Tam.* Ponna-vittalu, *Tel.* Punna-vitta, *Malyal.* Suragonne-bíja, *Can.* Sultáná-chámpá-bíj, *Beng.* Punnága-bíjam, *Sans.* Domba-aṭṭa, *Cing.* Of the oil—The Pinnay or Alexandrian laurel oil, *Eng.* Surpan-ká-tél, *Hind.* Surfan-ká-tél, *Duk.* Punnai-eṇṇey, *Tam.* Ponna-núne, *Tel.* Punna-eṇṇe, *Malyal.* Suragonne-eṇṇe, *Can.* Sultána-champá-tail, *Beng.* Punnága-tailam, *Sans.* Domba-tel, *Cing.*

Local Sources.—The fruits are one of the common drugs in Madras, and the oil is largely exported from Travancore. The latter can be obtained by expression from the kernel of the seeds in any quantity.

Price.—Of the fruits—Wholesale, Rs. 2 per maund; retail or bazaar, As. $1\frac{1}{4}$ per pound. Of the oil, Rs. 8 per cwt.

Physiological Actions.—Stimulant to the mucous membrane and skin.

Therapeutic Uses.—The oil exercises a great beneficial influence over the mucous membrane of the genito-urinary organs, and therefore highly useful in the treatment of gonorrhœa and gleet. Externally, it is a good and useful embrocation in rheumatism and gout. The watery paste of the kernel of the seeds applied to the painful joints and dried by the heat of fire, often affords a great relief in the same diseases, and may be resorted to in the absence of the oil.

Preparations.—The best and most convenient way of using the oil is floating on water, or as an emulsion with mucilage. The latter is preferable. The kernel of the seeds is bruised with hot water and made into a paste for external use, as mentioned above.

Doses.—If the oil is greenish brown, from fifteen to twenty minims; and if pale and greenish-yellow, from twenty to thirty minims; three or four times in the twenty-four hours.

European Drugs for which they may be substituted.—The oil for copaiba and cubebs.

Remarks.—The fruits are spherical, varying in diameter from half to one inch and a quarter, generally grey or greyish brown, and covered with a thin and shrivelled epidermis. The pericarp or shell is hard, thin, easily broken, and contains a loose and movable kernel.

The latter is roundish, pale yellow or reddish yellow, and bitterish in taste.

The fixed oil extracted from the seeds of *C. inophyllum* is palé and greenish-yellow with an odour of Tonquin beans if the seeds are such as those generally sold in the bazaar, a greater portion of which are small and young; but greenish brown, thicker and more viscid with a smell like that of an old and rancid ghee, if they are large and well matured. The oil is bitter in both cases.

The oil of *C. inophyllum* is one of the few drugs which had been omitted by mistake from my Collection of Drugs, when its first portion was forwarded in haste to the Calcutta International Exhibition in 1883. It, however, deserves to be noticed here in a special manner from its great usefulness when administered internally.

Although there is nothing in the sensible properties of this oil to indicate a poisonous character, yet, as far as my knowledge extends, it has never been administered internally in this or any other country. Having satisfied myself by personal use that it is neither detrimental to life nor deleterious to health up to certain quantity, I employed it in my practice and found it to be a very valuable drug. It acts as a specific on the mucous membrane of the genito-urinary organs, and its control, therefore, over gonorrhœa and gleet is very considerable. It is so certain and speedy in its action that its good effect in the above diseases is often noticed a few hours after the exhibition of its first dose.

† **Mesua ferrea,** *Linn.* **84.**

† **Ochrocarpus longifolius,** *Benth.* **85.**

Habitat.—Malabar and Western Ghâts.

Part Used.—The flowers.

Synonyms.—Nág-késar-ké-phul, *Hind.* Nágésar-ké-phúl, *Duk.* and *Beng.* Nágap-pú, Nágasháp-pú, Nágésar-pú, *Tam.* Nága-késara-puvvu, Gaja-pushpamu, *Tel.* Veḷutta-chempakap-pú, *Malyal.* Nága-késaram-pushpam, *Sans.* Whether sold separately or together, the vernacular synonyms of the flowers of both *M. ferrea* and *O. longifolius* are the same.

Local Sources.—The flowers of either *M. ferrea* or *O. longifolius* are never met with in the bazaars of Madras, and what are sold here under their names (*Nágésar-ké-phúl*), are Cassia-buds, which are the produce of species of *Cinnamomum.* The Hindustani name of the latter is *Kabáb-chiní* at Madras and *Siṭal-chiní* at some other places. The native druggists of Madras are aware of this fact, yet, they sell the Cassia buds as different drugs under two or three different names.

The samples of the flowers of *M. ferrea* and *O. longifolius* (**Nos. 84 and 85**) in my Collection of Drugs at Calcutta are from a distant place.

Physiological Actions.—Stimulant and carminative.

Therapeutic Uses.—Useful in some forms of dyspepsia and in hæmorrhoids.

Preparation.—Infusion, which is prepared in the ordinary way, the proportion of the flowers to boiling water being one to eight. I have not yet used the flowers in any other form.

Dose.—From one and a half to three fluid ounces.

European Drugs for which they may be substituted.—A very weak substitute for Spirit. ammon. arom., lavender and peppermint.

TERNSTRŒMIACEÆ.

‡ Camellia theifera, *Griff.* 86, 87 and 88.

Habitat.—Cultivated in China; and in the Nílgiris, Travancore, Darjeeling, Assam, Punjab and some other places of India.

Part Used.—The prepared leaves.

Synonyms.—Tea, *Eng.* Thé, *Fr.* Der Thee, *Ger.* Chá, Chá-ká-pattá, *Duk.* and *Hind.* Te-ilai, *Tam.* Tey-áku, *Tel.* Chá-pátá, *Beng.* Chá, *Guz.* Té-kóla, *Cing.* Laphé-khiáv, *Bur.* Ṣáé, *Arab.* Cháye, *Pers.* The tea growing in, or imported from, some particular places is generally named after those places in the bazaar; as *Nílgiri-ki-chá* or the tea growing on the Nílgiri hills (**No. 86**), *Chín-ki-chá* or China tea (**No. 87**) and *Singapúr-ki-chá* or the tea imported from Singapore (**No. 88**).

Local Sources.—Tea is one of the common and abundant articles in Madras. The black tea (*Káli-chá*) is more abundant and cheaper than the green one (*Harí-chá*).

Price.—Of the Nílgiri tea—Wholesale, Rs. 10 per maund; retail or bazaar, As. 8 per pound. Of the China tea—Wholesale, Rs. 15 per maund; retail or bazaar, Rupee 1 per pound. Of the Singapore tea—Wholesale, Rs. 14 per maund; retail or bazaar, As. 12 per pound.

Physiological Actions.—Nervine and stimulant-tonic, stimulant-diuretic, nutritive and slightly astringent.

Chemical Composition.—Volatile oil, gallotannic and gallic acids, quercetin, boheic acid, and the alkaloids theine, zanthine, and theophyline.

Therapeutic Uses.—Useful in some nervous disorders depending on exhaustion or depression of the nerve power. A strong and hot infusion of tea without milk and sugar, like that of coffee, is a means of arousing the nervous system when depressed by opium or some other narcotic, and also of removing drowsiness or sleep for some hours whenever it is desirable to do so. With milk and sugar, tea is a well known nutritive and very pleasant beverage, well suited to many cases of general and nervous debility brought on by previous illness.

Preparation.—Infusion, which is usually known as tea. As a nutritive beverage to be used with milk and sugar, as generally is the case, this infusion is prepared by infusing in a covered vessel two drachms of the prepared tea leaves in ten ounces of boiling water for 10 or 15 minutes. The infusion should be three or four times stronger for use in cases of poisoning from opium or other narcotic medicines.

Dose.—From four to eight ounces.

DIPTEROCARPEÆ.

*** Dipterocarpus turbinatus,** *Gærtn.*, and other species. **89, 90 and 91.**

Habitat.—Chittagong, Tipperah and the Malay Islands.

Part Used.—The balsamic exudation.

Synonyms.—The Wood oil or Gurjun balsam, *Eng.* Garjan-ka-tél, *Hind.* Lakrí-ká-tél, Ságván-ká-tél, *Duk.* Mara-enney, *Tam.* Although the meaning of the Dukhni name *Ságván-ká-tél* is teak oil, yet it is applied to the *Wood oil* in many bazaars of Southern India. As the teak tree produces no balsam or oil, there is no fear of the above error giving rise to any confusion.

Local Sources.—The wood oil is pretty common in many large bazaars of Southern India.

Price.—Of the black or dark-brown variety **(No. 89)**—Wholesale, Rs. 12 per maund; retail or bazaar, As. 10 per pound. Of the red or reddish-brown variety **(No. 90)**—Wholesale, Rs. 24 per maund; retail or bazaar, Rs. $1\frac{1}{4}$ per pound. Of the pale-white or grey variety **(No. 91)**—Wholesale, Rs. 18 per maund; retail or bazaar, Rupee 1 per pound.

Physiological Actions.—Internally, stimulant, diuretic and alterative; and externally, stimulant.

Chemical Composition.—Volatile oil, acid resin (gurgunic acid) and an indifferent resin.

Therapeutic Uses.—As an internal remedy the Gurjun balsam exercises a great beneficial influence over the membrane of the genito-urinary organs, and is therefore very useful in gonorrhœa and gleet. It also produces some good effect in early stages of leprosy. As an external remedy it is one of the few best local stimulants in several forms of cutaneous affections, particularly those of a scaly nature. It is also a useful application in rheumatism.

Preparation.—The best way of using this balsam internally is in the form of emulsion with mucilage.

Dose.—From one to three fluid drachms three times in the 24 hours.

European Drugs for which it may be substituted.—Copaiba, Donovan's solution and Citrine ointment. It is also a substitute for Chaul-mugra oil.

Remarks.—There are several varieties of Gurjun or Wood oil, but out of these, three are generally met with in the bazaar, which are known as *Suféd Garjan-ká-tél* or *Suféd Lakṛí-ká-tél* (the pale-white or grey variety), *Lál Garjan-ká-tél* or *Lál Lakri-rá-tél* (the red or reddish brown variety) and *Kálá Garjan-ká-tél* or *Kálá Lakṛí-ká-tél* (the black or dark brown variety). All the varieties of Gurjun oil are equally useful as a local stimulant, but the *red* or *reddish-brown* and the *white* or *grey* varieties are the best for internal use. The best medical properties of this oil are its usefulness in gonorrhœa and

gleet, and in all forms of psoriasis, including lepra-vulgaris. In gonorrhœa and gleet it is at least equal to Copaiba, and the only difference between these two drugs is that the former (Gurjun balsam) requires to be used in a much larger dose (℥ii to ℥iii) to produce the same effect as the latter. As Gurjun balsam is always used in the form of emulsion with mucilage the largeness of its dose is no disadvantage. With regard to its usefulness in psoriasis and lepra-vulgaris, I am not aware of any other local stimulant which is more efficacious in those diseases than this drug. I have either cured or relieved many cases of the above affections by the use of this drug, with little or no assistance of internal remedies. The internal use of Gurjun oil is also attended with benefit in some cases of true leprosy in its early stage; but its efficacy in this respect is greatly enhanced with the addition of from five to ten drops of *Chaulmugra oil* to each drachm of it. If well mixed in the above proportion, the combination of Chaulmugra oil cannot be detected. Some years ago I had received a bottle of Gurjun oil of this kind from a medical friend, which proved more useful in a case of true leprosy than all its varieties in the bazaar, but I did not know the existence of Chaulmugra oil in it until I was informed of it.

* Shorea robusta, *Gærtn.* 92, 93 and 94.

Habitat.—Godávari forest, Goomsur and foot of the Himalayas.

Part Used.—The resin.

Synonyms.—Rál, Dhúná, Ḍámar, *Hind.* Rál, *Duk.* Kungiliyam, *Tam.* Guggilamu, *Tel.* Kungiliyam, *Malyal.* Guggala, *Can.* Dhúná, Rál, *Beng.* Guggilam, Konshi-kaha, *Sans.* Rāḷa, Guggiḷu, *Mah.* Dummala, *Cing.* Qaiqahar, Qanqahar, *Arab.* Laãle-moâabbarí, *Pers.* The tree, *Sâl.*

Local Sources.—Out of the several varieties of this resin met with in every large bazaar of Southern India, only three are fit to be noticed as drugs. Two of these are known as *suféd* or white Rál, and the third as *lál* or red *Rál.* One of the white varieties is almost colorless and transparent **(No. 92),** and the other pale, yellowish or greenish white **(No. 93).** The third variety is either pale-red, yellowish-red or reddish-brown **(No. 94).**

Price.—Of the white varieties—Wholesale, Rs. 4 per maund; retail or bazaar, As. 3 per pound. Of the red variety—Wholesale, Rs. 2 per maund; retail or bazaar, As. 1½ per pound.

Physiological Actions.—Local stimulant and deodorant.

Therapeutic Uses.—It is not prescribed internally, but used occasionally for fumigation of rooms and houses to remove bad odors. It does not destroy offensive smell, but rather conceals it under its thick and odoriferous smoke. There is every reason to think that it will prove itself an efficient ingredient in many ointments and plasters if employed instead of pine and other resins.

European Drugs for which it may be substituted.—For pine and other resins imported from Europe.

† **Vateria indica,** *Roxb.* **(V. malabarica,** *Blume.***) 95 and 96.**

Habitat.—Malabar, Canara and Travancore.

Parts Used.—The resin and fat.

Synonyms.—The white dammar, Piney varnish or Indian copal, *Eng.* Suféd-ḍámar, *Hind.* and *Duk.* Veḷḷai-kunṛikam, Veḷḷai-ḍámar, Painí-pishin, *Tam.* Dúpa-dámaru, Tella-dámaru, *Tel.* Payana, Painipasha, Veḷḷa-kunturukkam, *Malyal.* Dúpa-anṭu, *Can.* Hal, Hal-dumula, *Cing.*

Local Sources.—Pretty common in large bazaars of Southern India. There are generally two varieties of this resin, one of which is good and superior **(No. 95),** and the other an inferior one **(No. 96).**

Price.—Of the superior variety—Wholesale, Rs. 4 per maund; retail or bazaar, As. 3 per pound. Of the inferior variety—Wholesale, Rs. 2 per maund; retail or bazaar, As. 1½ per pound.

European Drugs for which it may be substituted.—For pine and other resins imported from Europe.

Remarks.—The resin and the fat (the piney tallow of Canara) are useful as a basis for some ointments and plasters.

† **Shorea Tumbuggaia,** *Roxb.* **97.**

Habitat.—Cuddapah, North Arcot and Pálghat forests.

Part Used.—The resin.

Synonyms.—Black dammar, *Eng.* Kálá-ḍámar, *Hind., Duk.* and *Beng.* Karuppu-ḍámar, Tumbugai-pishin, *Tam.* Nalla-ḍámar, Nalla-rojan, *Tel.* Kaṛa-kundurukkam, Tumbugai-pasha, *Malyal.* Kálo-ḍámar, *Guz.* and *Mah.* The vernacular names of the black dammar, whether it is the produce of *S. Tumbuggaia* or of *Canarium strictum*, are almost the same.

Local Sources.—The resin is one of the common drugs in all the large markets of India.

Price.—Wholesale, Rs. 1½ per maund; retail or bazaar, Anna 1 per pound.

Physiological Actions.—External stimulant.

Therapeutic Uses.—Not used internally. To all appearance, it will form a good basis for some plasters and ointments.

European Drugs for which it may be substituted.—For Pine Rosin and Burgundy Pitch.

MALVACEÆ.

* **Gossypium herbaceum,** *Linn.* **98.**
* **Gossypium arboreum,** *Linn.* **99.**
* **Gossypium Barbadense,** *Linn.* **100. 101.**

Habitat.—Cultivated all over India.

Parts Used.—The hairs of the seeds or cotton (**No. 98**), the seeds (**No. 99**), young capsules (**No. 100**) and young shoots or leaves (**No. 101**).

Synonyms.—Of the hairs of the seeds—Cotton, *Eng.* Coton, *Fr.* Bamwolle, *Ger.* Rúí, *Hind.* and *Duk.* Parutti, *Tam.* Patti, Pratti, *Tel.* Parutti, *Malyal.* Hatti, *Can.* Ruí, Phútá, Karpásh or Kapás, *Beng.* Karpás or Karpása, *Sans.* Kápús, *Mah.* Ru, *Guz.* Kapu, *Cing.* Gún or Gon, Wá, *Bur.* Quṭun or Quṭn, *Arab.* Panbah, *Pers.* Of the seeds—Banólé, *Hind.* and *Duk.* Parutti-virai, *Tam.* Patti-vittulu, Karpása-vittulu, Pratti-vittulu, *Tel.* Parutti-vitta, *Malyal.* Hatti-bíja, *Can.* Karpásh-bíj, Kappás bíj, Karpásh-bíchí, *Beng.* Karpása-bíjam, *Sans.* Kápúsá-chá-bí, *Mah.* Rú-nú-bíj, Kapás-nu-bíj, *Guz.* Kapu-aṭṭa, *Cing.* Wá-sí, *Bur.* Ḥabbul-quṭn, *Arab.* Pan-bah-dánch, *Pers.* Of the capsules—Young or tender cotton fruit or capsules, *Eng.* Kapás-ké-pindé, *Duk.* Kounlébóndé-Kapás-ké, *Hind.* Parutti-pinji, *Tam.* Patti-pende, *Tel.* Of the young shoots or leaves—Kapás-ké-kőnpal, *Hind.* Kapás-ké-kóplíyán, *Duk.*

Local Sources.—The cotton and cotton-seeds are the commonest articles in the bazaar, but the young capsules and the young shoots are not sold. They can be obtained or gathered very easily.

Price.—Of the cotton—Wholesale, Rs. $1\frac{1}{8}$ per maund; retail or bazaar, Anna 1 per pound. Of the seeds—Wholesale, Rs. 3 per maund; retail or bazaar, As. 2 per pound.

Physiological Actions.—The cotton is not used internally. The seeds are nutrient and demulcent; and the young capsules and shoots, demulcent, slightly diuretic and astringent.

Therapeutic Uses.—The cotton is a very useful external remedy in burns, scalds and some other surgical diseases. The seeds exercise some good influence over gonorrhœa, gleet, chronic cystitis, consumption and some catarrhal affections. The fresh young capsules and shoots have been observed to produce good effects in some cases of dysentery and gonorrhœa. The control of the seeds over gonorrhœa and gleet is more manifest when combined with some other drugs, whose prescription is given under the head of *Remarks.*

Preparations.—As it is rather difficult to separate the kernel from the seeds, the latter are bruised and rubbed in water, strained through cloth and administered in the form of a draught. The fresh young capsules and shoots are also prepared and used in draught in the same way.

Doses.—Of the seeds, from two to four drachms; and of the fresh young capsules or shoots, one handful.

European Drugs for which they may be substituted.—The cotton for lint and tow imported from Europe. The seeds and other parts, for the oil of copaiba, cubebs, Iceland-moss, cod-liver oil, &c.

Remarks.—The cotton is known too well to require any description. It is the most useful and common remedy in burns and scalds, to which it is generally applied with *Carron oil* (equal parts of linseed oil and lime water) to assist the healing process by excluding the air and maintaining an equable temperature. For the same reasons, it is a very useful article for enveloping or wrapping up the limbs and other parts in some other diseases, as senile-gangrene, and also after some surgical

operations, as the tying of an artery for aneurism, &c. It should always be kept ready in hospitals in the form of wadding for the above purposes. The cotton is also a very useful, cheap, and convenient article for preparing pads for splints, &c.

The cotton seeds are round, dark-brown and about the size of black pepper. If examined soon after the removal of the cotton, they are clothed with greyish down. Their kernel is greenish, albuminous and slightly sweet in taste. I have used the following prescription of these seeds in several cases of gonorrhœa and gleet with encouraging results :—

Take of the *cotton seeds*, from two to four drachms; fruit of *Cuminum cyminum* (cumin seeds), from one and a half to three drachms; fruit of *Pimpinella Anisum* (anise seed), from one to two drachms; and the *silicious concretion* of *Bambusa arundinacea* (tabáshír), from fifteen to thirty grains. Bruise and rub all these ingredients well in a stone mortar with three or four ounces of water and pass the liquid through cloth. This draught is to be used four or five times in the twenty-four hours, according to the severity of the symptoms.

† Hibiscus Sabdariffa, *Linn.* The red variety. 102.

Habitat.—Cultivated all over India.

Part Used.—The seeds.

Synonyms.—The seeds of Roselle or Red Sorrell, *Eng.* Lál-ambáṛí-ké-bínj, *Hind.* Lál-ambáṛé-ké-bínj, *Duk.* Shivappu-kásal-virai, Shivappu-káshuruk-virai, Shímai-káshuruk-virai, Shivappu-puḷachi-kírai-virai, *Tam.* Erra-gómgura-vittulu, Shíma-gómgura-vittulu, Erra-góngúra-vittulu, Erra-góng-kúra-vittulu, Erra-góng-áka-vittulu, *Tel.* Chivanna-pulachi-chira-vitta, *Malyal.* Lál-mista-bíj, *Beng.* Lál-anbáṛí-nu-bíj, *Guz.* Lál-anbáṛí-cha-bíj, *Mah.* Ténbo-khen-boun-si, *Bur.*

Local Sources.—The seeds are either sold in the bazaar or procurable in some gardens.

Price.—Wholesale, Rs. 8 per maund; retail or bazaar, As. 5 per pound.

Physiological Actions.—Demulcent, diuretic and tonic.

Therapeutic Uses.—Useful in dysuria and strangury, and also in some mild cases of dyspepsia and debility.

Preparations.—Used in the form of a draught by bruising with water and straining through cloth.

Doses.—From one to two drachms, three or four times in the 24 hours.

European Drugs for which it may be substituted.—Sweet nitre.

Remarks.—The seeds are reddish grey or reddish brown, odorless, and possess a feeble mucilaginous taste. They are about the size of, and bear some resemblance to, the seeds of *Ipomœa hederacea* (Kálá-dánah). The fleshy red calyx of this plant is acid like tamarind and is an article of diet.

The seeds of the red variety of *H. Sabdariffa* are identical with those of the white or greenish white variety of the same plant in their physical and medical properties; but I sent the former only **(No. 102)** to the Calcutta International Exhibition, because my experience was confined to them when my Collection of Drugs was despatched in 1883. I have, however, used the seeds of the white variety also in my practice since that period, and found them to be identical in every respect as just mentioned.

† **Hibiscus rosa-sinensis,** *Linn.* **103.**

Habitat.—One of the most common and abundant ornamental plants cultivated in India.

Part Used.—The flowers.

Synonyms.—Shoe-flower, *Eng.* Ketmi de Cochinchine, *Fr.* Jásún or Jásún-ké-phúl, Javá, *Hind.* Jásút or Jásút-ké-phúl, Guḍhél, Kuḍhal, *Duk.* Shappáttup-pu or Chappáttu-pú, *Tam.* Dásáni-puvvu, Java-pushpamu, *Tel.* Chempa-rattip-púva, Ayam-paratti, *Malyal.* Dásváḷaḍa-huvvu, *Can.* Jóbá-phúl, Or-phúl, *Beng.* Japá-pushpam, *Sans.* Dásinda-cha-phúla, *Mah.* Jásút-nu-phúl, *Guz.* Khounyan, *Bur.* Angḥaráe-hindí, *Arab.* and *Pers.*

Local Sources.—The dry flowers are sold in some large bazaars of South India, and the fresh ones are procurable in almost every garden.

Price.—Of the dry flowers—Wholesale, Rs. 2 per maund; retail or bazaar, As. 2 per pound. The fresh flowers can be gathered either for nothing or at the cost of collection.

Physiological Actions.—Refrigerant, diuretic, demulcent and anti-pyretic. It is also a good remedy for the hair.

Therapeutic Uses.—Useful in relieving thirst in fever, and some times the fever itself if the attacks are mild. Scalding of urine, stran-gury, and irritability of the bladder often disappear under the use of this drug. Of the two preparations of the flowers I have employed internally, namely, the syrup and infusion, the former is much more efficacious. The oil prepared from the juice of the fresh flowers of *H. rosa-sinensis* is very useful in increasing the growth and color of the hair. To obtain the desired effect it is required to be applied well to the hair every day for some weeks.

Preparations.—Syrup, infusion and oil. The syrup is prepared thus —Take of the petals, fresh or dry, ten ounces; water, three pints; boil on a slow fire till the liquid is reduced to one pint and a quarter. When cool, rub and squeeze the petals with the hands, and strain the liquid through cloth or muslin. Add to this liquid ten ounces of re-fined sugar and heat it again gently till it assumes the consistency of an ordinary syrup. The fresh petals are preferable to the dry ones. The infusion: Take of fresh petals, cut into small pieces, four ounces; boiling water, one pint; infuse in a covered vessel for two hours and strain. The oil: Take the juice of the fresh petals and olive oil, in equai proportion by weight; boil on a slow fire till the watery portion is evaporated; cool and keep the oil in tight by closed bottles.

Doses.—Of the syrup, from four fluid drachms to one fluid ounce, repeatedly and well diluted with water; of the infusion, from two to four fluid ounces, four or five times in the 24 hours.

European Drugs for which they may be substituted.—Diluted Phosphoric acid, sweet nitre, effervescing draughts, Macassar-oil and other proprietary Hair Restorers.

*Hibiscus esculentus, *Linn.* (Abelmoschus esculentus, *W. et A.*) 104.

Habitat.—It is cultivated extensively in every part of India.

Part Used.—The capsules.

Synonyms.—Okra capsule, *Eng.* Bhindí, Rám-turí or Rám-toráí, *Hind.* Bhéndí, *Duk.* Veṇḍai-káy, *Tam.* Benḍa-káya, *Tel.* Veṇṭak-káya, *Malyal.* Bendé-káyi, *Can.* Dhéras or Dhénras, Rám-torai, *Beng.* Dárviká, *Sans.* Bhíndá, *Mah.* Bhiṅḍu, *Guz.* Bandaká, *Cing.* Younpadi-sī or Youn-padí-ti, *Bur.* Bámiyá, *Arab.* Bámiyah, *Pers.*

Local Sources.—The fresh and young capsules being one of the most common vegetables used by natives are sold in every town and village in India. The sun-dried tender capsules **(No. 104)** are not sold in the bazaar, but require to be dried if necessary.

Price.—Of the fresh capsules—Wholesale, Re. 1 per maund; retail or bazaar, Pies 6 per pound.

Physiological Actions, Therapeutic Uses, Preparations and Doses.—Not having used this drug in my practice, I could say nothing about it under the above heads from personal experience, and therefore refer the reader to the *Pharmacopœia of India*, p. 35. The description of the capsules is also very good and graphic in that work.

European Drugs for which it may be substituted.—Marsh-mallow, Pearl Barley and Liquorice Root.

‡Hibiscus Abelmoschus, *Linn.* (Abelmoschus moschatus, *Mœn.*) 105.

Habitat.—The plant is rather rare in the Madras Presidency, but appears to be pretty abundant in Bengal and other parts of India.

Part Used.—The seeds.

Synonyms.—Musk-mallow seeds or Musk-seeds, *Eng.* Mushk-dánah, *Pers.* and *Hind.* Mushk-bhéndí-ké-bínj, Mushk-dánah, *Duk.* Kastúri-veṇḍaik-káy-virai, Káṭṭuk-Kastúri-virai, Shímai-veṇḍaik-káy-virai, *Tam.* Kastúrí-benḍa-vittulu, Karpúra-benda-vittulu, *Tel.* Káṭṭu-kastúri, Kastúri-veṇṭa-vitta, *Malyal.* Mushak-dáná, *Beng.* Lata-kasturíkam, *Sans.* Balu-vakí, *Bur.* Ḥabbul-misk, Ḥabbul-mishk or Ḥabbul-mushk, *Arab.*

Local Sources.—Not sold in the bazaars of Southern India. The sample of the seeds and capsules in my Collection of Drugs **(No. 105)** is from some plants raised by myself.

Physiological Actions.—Stimulant, stomachic and antispasmodic.

Therapeutic Uses.—Useful in nervous debility, hysteria, atonic dyspepsia and a few other affections in which musk is indicated.

Preparations.—The best and most efficacious form of using the *Musk-mallow seeds* is tincture, which is prepared as follows:—Take of the seeds, in coarse powder, two ounces and-a-half; rectified spirit, one pint. Macerate the seeds for 48 hours in fifteen fluid ounces of the spirit in a bottle, agitating occasionally; then transfer to a percolater, and when the fluid ceases to pass continue the percolation with the remaining five ounces of spirit. Afterwards subject the contents of the percolater to pressure, filter the product, mix the liquids, and add sufficient rectified spirit at the end to make one pint. The seeds can also be used in powder, which requires no explanation for its preparation.

Doses.—Of the tincture, from one to two fluid drachms; of the powder, from ten to thirty grains. In more than three drachm doses, the tincture produces headache and giddiness.

European Drugs for which it may be substituted.—Musk, saffron and rue leaves.

Remarks.—Although *H. Abelmoschus* is occasionally met with in some gardens and fields and can be very easily cultivated, its seeds (Mushk-dánah) are not sold in the bazaars of South India. But the seeds of *Psoralia corylifolia* are deceitfully sold under the above name by some native druggists at Madras, who take advantage of their knowledge of both drugs bearing a great resemblance to each other. There is no difficulty, however, in distinguishing the seeds of *H. Abelmoschus* from those of *P. corylifolia* if the following distinctions are observed:—

Seeds of H. Abelmoschus.	*Seeds of P. corylifolia.*
1. Kidney shaped, slightly compressed and striated, with a hilum in the centre of the concave border.	1. Oval or oblong and flat.
2. Brown in color and about two lines in length.	2. Brown or dark-brown in color, and about two or two and-a-half lines in length.
3. Smell like that of the pure musk, but very feeble, not being distinctly perceptible until the seeds are chewed or rubbed between the fingers.	3. Smell aromatic and musty.
4. Taste not bitter.	4. Taste bitterish.

† Sida carpinifolia, *Linn.* 106.

Habitat.—A common weed in some low and damp places.

Part Used.—The root.

Synonyms.—Isbadí or Isbadí-kí-jaṛ, Isarbadí, *Duk.* Vaṭṭa-tirippi-vér, *Tam.* Visha-boddi or Visha-boddi-véru, Chiṭi-muṭi-véru, Mutuva-pulogum-véru, *Tel.* Pila-barélá-ṣhikar, *Beng.* Sirivadi-babila-múl, *Cing.*

Local Sources.—Found in the bazaars of South India.

Price.—Wholesale, Rs. 7 per maund; retail or bazaar, As. 6 per pound.

Physiological Actions.—Diaphoretic, antipyretic, stomachic and tonic.

Therapeutic Uses.—It has been found very useful in febrile affections and some forms of dyspepsia, and also in mild cases of debility from previous illness, &c.

Preparation.—Decoction: Take of the root, cut into small pieces and bruised, four ounces; water, one pint and-a-half; boil on a slow fire till the liquid is reduced to one pint, and strain when cool.

Dose.—From one to three fluid ounces three or four times a day. It should be repeated more frequently when intended to relieve pyrexia in febrile affections.

European Drugs for which it may be substituted.—Pulv. Antimonialis, Liq. Ammon. Acet., Gentian and Calumba.

Remarks.—The root of *S. carpinifolia* or Isbadí of the bazaar is thin, long and cylindrical, varying in length generally from 2 or 3 to 6 inches or more, and in thickness from a quill of a crow to that of a goose; very rough, knotty, contorted and often bent upon itself once or twice. It is bitter in taste, and possesses no distinct smell; brown or dark-brown externally and brownish-white internally. A transverse section of this root displays its woody portion to be very porous and to consist of conspicuous medullary rays without concentric zones.

The above is correctly the root of *Sida carpinifolia*, which is synonymous with *S. acuta* and *S. lanceolata;* but is often confounded with another, and a much larger root, which, as described by Sir Whitelaw Ainslie in his *Materia Indica*, p. 179, "is not unlike the common liquorice-root in appearance." The cause of this confusion is that the villagers who gather the above roots in the jungle generally bring them to the bazaar in the same bundle or basket, and sell them together indiscriminately under the same native names. *Isri* (*Duk.*) and *Isvari-vér* (*Tam.*) are, however, the proper names of the larger root alluded to by Ainslie, the botanical source of which is not yet correctly ascertained, and I have not, therefore, included it in my Collection of Drugs. The Tamil names *Malai-tángi*, *Arruá-manu-pundu*, &c., which occur in some books are not applied to any of these roots in Madras.

The root of *S. carpinifolia* is much resorted to by the Hindu medical practitioners in South India, but the quantity in which they employ it is rather too small to produce any distinctly good effect. They generally use it with ginger in a weak infusion and only once or twice a day. The benefit derived from this plan is not more than what is expected from the presence of ginger in the infusion. After some trials, however, I found the proper way of ensuring the best effects of the root is to administer it repeatedly in the form of a strong decoction, as that described under the head of *Preparation* in the present article.

† Sida spinosa, *Linn.* (S. retusa, *Wight.*). 107 and 108.

Habitat.—More common in South India than the preceding plant.

Parts Used.—The leaves (**107**) and root (**108**).

Synonyms.—Janglí-méthí, *Hind.* and *Duk.* Mayir-máṇikkam, *Tam.* Mayilu-máṇikyam, *Tel.* Mayir-máṇikkam, Kaṭṭa-ventiyam, *Malyal.* Káḍu-menthyá, *Can.* Píla-baréla, Bón-méthí, *Beng.* Koṭi-kám-bábila, Mair-máṇikam, *Cing.* Shanbalíde-barri, Shamlíthe-dashtí, *Pers.* Kulbahe-barrí, *Arab.*

Local Sources.—Not sold in the bazaar, but can be obtained easily from jungles and fields.

Physiological Actions.—The leaves are demulcent and refrigerant, and the root acts as a gentle tonic and diaphoretic.

Therapeutic Uses.—The leaves are useful in some cases of gonorrhœa, gleet and scalding of urine; and the root in some mild cases of debility and ephemeral fever.

Preparations.—The leaves are bruised in water, strained through cloth, and administered in the form of a draught; and the root used in decoction prepared in the same way as that of the root of *S. carpinifolia.*

Doses.—Of the leaves, one handful three or four times a day; and of the decoction of the root, from one to three fluid ounces every fourth or fifth hour.

European Drugs for which it may be substituted.—The leaves for Oleum Copaibæ and Spiritus Ætheris Nitrosi; and the root for Pulvis Antimonialis and Chiretta.

Remarks.—There is nothing particular in this root, it being a small, hard and tapering one; brown externally and white internally and possesses neither a taste nor smell. I have tried it in some cases, but it has no influence whatever over rheumatism or intermittent fever, as is supposed by some native practitioners. It is a very weak drug and only useful in some very slight cases of fever and debility, as already mentioned.

† Thespesia populnea, *Corr.* 109 and 110.

Habitat.—One of the commonest trees in South India.

Parts Used.—The bark (**109**) and fruit (**111**).

Synonyms.—Of the bark—Tulip or Portia bark, *Eng.* Páras-pipal-kí-chhál, *Hind.* Páras-pippal-kí-chhál, *Duk.* Púrasha-paṭṭai, *Tam.* Gangarénu-paṭṭa, Ganga-rávi-paṭṭa, Muniganga-rávi-paṭṭa, *Tel.* Púvvaraṣha-tóli, *Malyal.* Pórash-chhál, *Beng.* Párasá-cha-paṭṭa, *Mah.* Búgni-paṭṭe, *Can.* Párasa-piplo-nu-chál, *Guz.* Gansúri-potta, *Cing.* Of the fruit—Tulip or Portia fruit, *Eng.* Páras-pípal-ká-phal, *Hind.* Páras-pippal-ká-phal, *Duk.* Púrasha-pazham or Púrasha-paṛam, *Tam.* Gangarénu-panḍu, Gangarávi-panḍu, Muni-ganga-rávi-panḍu, *Tel.* Púvvaraṣha-káya, *Malyal.* Púrash-phal, *Beng.* Púrasa-cha-phal, *Mah.* Búgni-haṇṇu, *Can.* Párasu-piplo-nu-phal, *Guz.* Gansúri-ká, *Cing.*

Local Sources.—The bark and fruit are not sold in the bazaar, but can be gathered very easily, the plant being found everywhere in Madras.

Physiological Actions.—The bark is a mild astringent tonic, but neither alterative nor insecticide, as is supposed by some natives of this country. The fresh fruit or capsule is insecticide.

Therapeutic Uses.—The bark is useful in some slight cases of debility and atonic dyspepsia, and the yellow viscid juice of the fresh capsule is a specific in scabies by destroying the parasite *Acarus scabiei*. The fresh capsules themselves are also insecticide to some extent if used externally in the form of a very strong decoction.

Preparations.—Decoction of the bark and of the fresh capsules. Decoction of the bark: Take of the bark, cut into small pieces, six ounces; water, three pints; boil until the liquid is reduced to one pint, and strain. Decoction of the capsules: Take of the fresh and half-ripe capsules, cut into small pieces, ten ounces; water, three pints; boil until the liquid is reduced to one pint, and strain when cool. The yellow juice is best obtained by wounding or making small incisions on the fresh and half-ripe capsules, but the juice is generally so scanty that it cannot be collected in a vessel. It requires to be taken up by the finger and applied over the vesicles of itch.

Dose.—Of the decoction of the bark, from two to four fluid ounces, three or four times a day. The decoction of the fresh capsules is not intended for internal use, but is employed externally as a wash for the parts affected with scabies.

European Drugs for which they may be substituted.—The fresh capsules, for Ung. Hydrarg. Nitratis and Ung. Sulph. Co.; and the bark, for Calumba.

Remarks.—The bark of the trunk and large branches is reddish brown, very rough and scaly externally, and of reddish-grey color internally. It is odorless and possesses no distinct taste. It contains a garnet-colored resin and a small quantity of tannin. The fresh and half-ripe capsule is green, roundish and obtusely five-angled, with a cup-shaped and persistent calyx. It abounds in yellow, viscid and somewhat acrid juice, consisting of a gum-resin forming a yellow emulsion with water.

‡ Althæa rosea, *Cav.* ‡ Althæa officinalis, *Linn.* 111, 112. and 113.

Habitat.—*A. rosea* or the English hollyhock is a common ornamental plant in the gardens and bungalows of Europeans in India, and also cultivated by many Muhammadans in their gardens and houses for medicinal purposes. *A. officinalis* or the marsh-mallow is also found in some gardens of Madras.

Parts Used.—The root or root-bark (**No. 111**), petioles (**No. 112**), seeds (**No. 113**) and stems.

Synonyms.—Of the root—Réshai-*Ḳhiṭmí*, *Pers.* *Ḳhiṭmí*-kí-jaṛ, *Ḳhairó*-kí-jaṛ, *Hind.* Gúle-*Ḳhairó*-kí-jaṛ, *Duk.* Aslul-*Ḳhiṭmí*, *Arab.* Of the petioles—*Ḳhiṭmí*-ké-pattón-ké-daṇḍíyán, *Ḳhairó*-ké-pattón-

ké-dandíyán, *Hind.* Gule-*Ḳh*airó-ké-pattón-ké-dandíyan, *Duk.* Of the seeds—Tu*kh*me-*Ḳh*iṭmí, *Pers.* *Ḳh*iṭmí-ké-bínj, *Ḳh*airó-ké-bínj, *Hind.* Gule-*Ḳh*airó-ké-bínj, *Duk.* Bazrul-*Ḳh*iṭmí, *Arab.* Of the stem—Sáqul-*Ḳh*iṭmí, *Arab.* Sáqe-*Ḳh*iṭmí, *Pers.* *Ḳh*airó-ki-sáq, *Ḳh*iṭmi-ki-sáq, *Hind.* Gule-*Ḳh*airó-ki-pér, *Duk.*

Local Sources.—The dry root and seeds are sold in many large bazaars of India, but not any other part of the plant. The fresh plant, however, which is by far the most useful, is procurable in many gardens at Madras.

Price.—Of the dry root—Wholesale, Rs. 4 per maund; retail or bazaar, As. 3 per pound. Of the seeds—Wholesale, Rs. 8 per maund; retail or bazaar, As. 6 per pound.

Physiological Actions.—Demulcent, refrigerant and emollient.

Therapeutic Uses.—The mucilage of the petioles, stem and roots is generally a very useful adjunct to other medicines in dysentery and mucous diarrhœa, and in some very slight cases it is sufficient by itself to relieve these diseases to a great extent. Tormina and tenesmus are the symptoms which are most relieved by it. The decoction of the dry root and seeds is useful in irritable and inflamed states of the pulmonary and genito-urinary mucous membranes.

Preparations.—The fresh petioles, stem and roots yield a mucilage when any of them are cut into pieces, broken, and shaken in water. The neatest way of preparing this mucilage is to bruise the pieces and tie them in a piece of thin cloth or muslin, and then soak and shake them in water. The decoction of the root and of the seeds is prepared in the ordinary way, the proportion of the former being six ounces and of the latter four, to one pint and-a-half of water. In either case the drug should be boiled on a very slow fire till the liquid is reduced to one pint, and strained when cool. Both the mucilage and decoction are rendered very palatable by the addition of a small quantity of sugar.

Doses.—Of the mucilage, from one to three fluid ounces, and of the decoction, from two to four fluid ounces; as often as it is necessary.

European Drugs for which they may be substituted.—Quince seeds and Tragacanth.

Remarks.—The native names and medical properties of *A. rosea* and *A. officinalis* are the same, and they are therefore discussed together.

† Bombax malabaricum, *DC.* 114 and 115.

Habitat.—Pretty common in Southern India.

Parts Used.—The gum **(No. 114)**, seeds **(115)**, dry young fruit, tap-root of the young plant, bark and cotton.

Synonyms.—Of the gum—Mócharas, *Hind.* and *Duk.* Of the seeds—Red silk-cotton seeds, *Eng.* Ragat-seṅbal-ké-bíṅj, Ragat-sémal-ké-bínj, Káṅṭí-séṅbal-ké-bínj, *Hind.* Lál-*kh*aṭyán-ké-bínj, *Duk.* Mul-ilava-virai, *Tam.* Mundla-búraga-vittulu, *Tel.* Puḷa-maram-vitta, Muḷḷ-ilava-vitta, Muḷḷila-púḷa-vitta, *Malyal.* Mullu-búraga-bíja, *Can.* Rokto-sémal-bíj, *Beng.* Kaṭṭu-imbul-aṭṭa, *Cing.* Lepáṅ-bín-zí, Lepháṅ-bín-sí, *Bur.* Of the dry young fruit—Ragat-séṅbal-ké-pindé, *Hind.* Lál-*kh*atyán-ké-pindé, *Duk.* Maráṭi-moggu, *Tam.* Maráṭi-mogga, *Tel.* Of

the tap-root of the young plant—Sémal-múslí, Múslá, Múslá-sémal, Múslí-sémal, *Hind.* Of the bark—Ragat-sémal-kí-*chh*ál, Kánṭí-sén-bal-kí-*chh*ál, *Hind.* Lál-*kh*atyán-kí-*chh*ál, *Duk.* Muḷ-ilava-paṭṭai, *Tam.* Mundḷa-búraga-paṭṭa, *Tel.* Muḷḷ-ilava-tóla, *Malyal.* Rokto-sémal-ṣál, *Beng.* Kaṭṭu-imbul-potta, *Cing.* Of the cotton—The red-cotton, *Eng.* Ragat-séṅbal-kí-rúí, *Hind.* Lál-*kh*atyánkí-rúí, *Duk.* Muḷ-ilava-parutti, *Tam.* Mundḷa-búraga-patti, Muḷ-ilava-patti, *Tel.* Puḷa-maram-parutti, *Malyal.* Muḷḷu-bú-raga-hatti, *Can.* Rokto-sémal-rúí, *Beng.* Kaṭṭu-imbul-kapu, *Cing.* Lepáṅ-bin-guṅ, Lepháṅ-bin-wá, *Bur.*

Local Sources.—Of the three varieties of the gum (*Mócharas*) described under the head of "*Remarks*," the third is plentiful in all the large bazaars of South India, the first is met with occasionally, and the second is rather rare. The young fruit (*Maráṭi-moggu*) is more common and abundant than the gum; and the seeds, tap-root of the young plant, bark and cotton are not sold, but as the plant is pretty common in Madras, there is no difficulty in collecting them in the proper season.

Price.—Of the third variety of the gum, which is most commonly met with in the bazaar—Wholesale, Rs. 8 per maund; retail or bazaar, As. 6 per pound. Of the first variety—Wholesale, Rs. 12 per maund; retail or bazaar, As. 8 per pound. Of the dry young fruit—Wholesale, Rs. 3 per maund; retail or bazaar, As. 2 per pound.

Physiological Actions.—The gum is astringent and demulcent; the seeds nutrient and demulcent; the young fruit stimulant-diuretic, tonic, aphrodisiac, expectorant, and exercises a great beneficial influence over the membrane of the genito-urinary organs; the tap-root is demulcent, tonic, slightly diuretic, and aphrodisiac; the bark is demulcent, diuretic, tonic, and slightly astringent; and the cotton is employed only externally for its mechanical properties (softness and elasticity) in padding splints and covering burned and inflamed surfaces, &c.

Therapeutic Uses.—The gum is useful in diarrhœa, dysentery and other affections in which kino and catechu are beneficial. The therapeutic uses of the seeds are similar to those of the seeds of *Gossypium herbaceum*, *G. arboreum* and *G. Barbadense*. The benefit of the dry young fruits in calculous affections and chronic inflammation and ulceration of the bladder and kidneys, including strangury and all other forms of dysuria, except those depending on mechanical causes, is remarkable. The fruits are also useful in weakness of the genital organs and in most of the disorders in which Gentian and Calumba are resorted to. As therapeutic agents, the tap-root, and the bark in the forms of decoction and extract, are nearly identical in their usefulness with *Márátimoggu* and therefore employed in almost the same affections. The cotton of *B. malabaricum* is useful in all the surgical cases, &c., in which the cotton of *Cochlospermum Gossypium* is employed, and the manner of using it is also the same.

Preparations.—Of the gum—Simple and compound powders. The simple powder is to be prepared in the ordinary way. Compound powder: Take of *Mócharas*, in powder, four drachms and thirty-two grains; *Bengal-kino* (*Butea frondosa*), in powder, four drachms; *opium*, in powder, sixteen grains; and the dry mucus or pulp of the

Emetic-nut (*Randia dumetorum*), in powder, one drachm and four grains. Mix the ingredients thoroughly, pass the compound powder through a fine sieve, and finally rub it lightly in a mortar. Of the seeds—The seeds are used in the form of emulsion by bruising them with water and straining the liquid through cloth. Of the dry young fruits—Simple powder, which is to be prepared in the usual manner, after removing their stalks. Of the tap-root—Simple powder, prepared by pulverizing the dry slices of the tap-root in the ordinary way. It should be kept in a stoppered bottle. Of the bark—Decoction and extract. Decoction: Take of the bark, in coarse powder, four ounces; water two pints; boil till the liquid is reduced to one pint, cool and strain. Extract: Take of the bark, in coarse powder, one pound; boiling water, one gallon; soak for twenty-four hours and then boil till the liquid is reduced to one pint. Strain and evaporate the liquor over a sand or water-bath to the consistence of an extract.

Doses.—Of the simple powder of the gum, from twenty to forty grains; and of the compound powder, from sixteen to thirty-two grains. Of the seeds, from two to three drachms; of the powder of the fruit, from thirty grains to one drachm; of the powder of the tap-root, from forty to eighty grains; of the decoction, from one to two fluid ounces; and of the extract, from seven to fifteen grains; three or four times in the twenty-four hours.

European Drugs for which they may be substituted.—The gum for Kino, Rhatany and Logwood; the seeds for Tragacanth, Sweet-almonds and Copaiba; and the young fruit, tap-root and bark, for Pareira Brava, Buchu, Broom-tops, Phosphorus, Cantharides, Calumba, Gentian and Spiritus Ætheris Nitrosi.

Remarks.—There are at least three varieties of the gummy substance known as *Mócharas* in the bazaar. The first variety occurs in very irregular, nodular, smooth, opaque, light or pale-brown pieces with internal cavities. The cavities are generally small and numerous, but sometimes few and large. In the latter case, the pieces often assume the appearance of a shell. The second is a mere sub-variety of the first, and the only difference between them is that the pieces in the former are very hard, heavy, dark-brown and cannot be reduced to powder without great difficulty. They are sometimes so smooth that they shine, and possess but few cavities. The third and most common variety consists of very irregular, angular and hard fragments or pieces of various size and of a dark or dirty brown color. The drug in all its varieties is odorless and possesses an astringent and demulcent taste. When placed in water it swells up to a considerable size, and some tannin enters into solution, the insoluble portion resembles tragacanth.

Mócharas is considered in some native medical works to be the produce of *Areca Catechu*, hence its Persian name *Gulefófal*, which means the flowers of *betel-nut*; and in many others it is referred to *B. malabaricum* as its source. To make myself sure on this point, I made many examinations and inquiries during the last seventeen or eighteen years, and am in a position to say that there is no connection whatever between *Mócharas* and *Areca Catechu*. I can also state positively that all the varieties of *Mócharas* met with in the bazaar are, as I shall show presently, the produce of *B. malabaricum*. With reference to this point

the *Pharmacographia Indica* has the following interesting note;—"Supári is the fruit of *Areca Catechu*, but children masticate instead of it the blunt thorns of *B. malabaricum* to which they give the name of supári. In this way the gum has come to be called *Supári-ka-phul*, which has misled some into supposing Mocharas to be the produce of the areca."

I made several attempts to extract a gum or resin artificially from this plant, but failed on every occasion. No gum or resin of any kind is produced by it on wounding or making incisions, however deep; but a more or less resinous substance exudes occasionally and spontaneously from its bark according to its age. If the plant is not very large and older than thirty or forty years, the exudation is only very small and occasional. The matter exuded is for some days at the beginning yellowish red or of flesh color, and then assumes a brownish hue. After some months it gradually acquires the form I have described in the first variety. The second variety of *Mócharas* is produced in the same way if the plant is much larger and older. But when the tree is very large and older than sixty or seventy years the exudation of the resin occurs every year soon after the rainy season. A large quantity of thick, brown and viscid fluid flows spontaneously from a natural crack, fissure, or wound in the bark of the stem or large branch and collects on the ground. When dry, this forms the most common and abundant kind of *Mócharas* in the bazaar, which I have described as the third variety. In the *Pharmacographia Indica* Mocharas is described as the product of diseased action in the cells of the bark. In a village about seven or eight miles on the west of Madras (Codumbaukum) there is a very large and old tree of this kind which yields annually a pretty large quantity of *Mócharas* in the manner just explained. The specimen of *Mócharas* (**No. 114**) forwarded with my Collection of Drugs to the Calcutta International Exhibition was partly from this tree and partly from the bazaar. Whilst the third variety is the cheapest and most common, the first is the most efficacious as a drug.

The seeds of *B. malabaricum* are about the size of black pepper, brown, smooth and roundish, with a very small and short but distinct ridge on one side of the hilum. I have used these seeds in my practice and found them to possess the medical properties mentioned under the heads of "*Physiological Actions*" and "*Therapeutic Uses.*"

There is much confusion about the Tamil and Telugu name *Maráti-moggu* in the bazaar of South India. What are sold in Madras under that name are very young and tender fruits of either *Bombax malabaricum* or *Eriodendron anfractuosum*, but more frequently the former. In some other places the buds of poisonous plants, *Datura alba* and *D. fastuosa*, are sold under the same name; and in a few more again, the buds of *Artabotrys odoratissima*. In the *Materia Indica*, Vol II, page 185, Marati-moggu is said to possess sedative and slightly intoxicating properties. The fact is, that the drug to which the name *Maráti-moggu* was applied originally, or ought to be applied at present, is not known. The young fruits of *B. malabaricum* being not only the most common, but also the most useful of all the drugs to which that name is often applied, it should, in my opinion, be restricted to them. It is with this view I have included the name under the head of "*Synonyms*," in the present article.

The young fruits of *B. malabaricum*, when separated from their stalks, as they should always be before they are used as a medicine, vary

in their length from one to three quarters of an inch, and in their thickness from one to two lines; and are five-angled or roundish, and conical or tapering. They are brown or dark-brown when old, and grey when new; odorless and slightly aromatic in taste. As young as they are they contain minute black seeds, and are distinctly five-celled. The stalks of these fruits are about the same length as the latter (one to three quarters of an inch), but somewhat less in thickness, paler in color, rough and often knotty or bent in the centre. The above fruits, with their stalks attached to them, particularly when fresh, bear a great resemblance to flower-buds; hence the word *moggu* or bud. The meaning of the word *maráṭi* is not correctly known.

The dry young fruits of *Eriodendron anfractuosum* are sometimes sold in the bazaar under the same name (*maráṭi-moggu*) and used for the purpose of adulteration and substitution of those of *B. malabaricum*. Although the similarity between the fruits of both plants is very great, yet the difference between their stalks, which are almost always attached to them, is so distinct that they can be very easily distinguished from each other. The fruit stalk of the former is round, about the thickness of a pin, and two or three times longer than the fruit; and therefore contrasts a great deal with that of the latter, which is described, in the preceding paragraph. The fruits of *E. anfractuosum* are always round without any ridge near the hilum, and somewhat larger and darker in color than those of *B. malabaricum*.

The cotton of *B. malabaricum* is of a reddish hue when new, hence the English designation " the red cotton plant."

In some native and other medical works two useful and common bazaar drugs, viz., the *Suféd* or white *Músli* and the *Káli* or black *Músli* are erroneously considered to be the produce of *B. malabaricum*. Both are supposed to be the roots of this plant, the only difference being that the former is produced before, and the latter after, it begins to flower. I have repeatedly dried and examined not only the roots but also the rootlets of this tree, both before and after it was in flower, but never found them to bear the smallest resemblance to any of the varieties of white or black *Músli*. The *Suféd-músli* of Calcutta, Bombay, Hyderabad, and almost all other parts of India, is the root of *Asparagus adscendens*, and of Madras and a few other places in South India, that of *A. sarmentosus*. *Curculigo orchioides* is the source of the *Káli-músli* of the Madras Presidency and many other localities, and *Ancilema tuberosa* that of the drug known under the same name in some other parts of India. There is, however, another variety of *Músli*, which, as far as my knowledge extends, is not sold in any bazaar, but mentioned in many Persian and other medical works. This is the tap-root of the young plant of *B. malabaricum*, and correctly spoken of as *Múslá*, *Múslá-simal*, or *Músli-sémbal* in Dr. George Watt's *Dictionary of the Economic Products of India*, Vol. I, p. 491, in contradistinction to *suféd* and *káli músliés* of the bazaar.

The Sémal-múslí is, like the tap-root of many other young plants, tapering, and varies a great deal in its size according to the age of the plant from which it is taken. If the age of *B. mauabaricum* is two years (which is the longest period allowed for selecting the root), the tap-root is generally about the size of a long radish, and if only below six months, it is from 4 to 7 inches long and about the thickness of a finger. Fifteen to twenty-one months is about the best period for

selecting the tap-root according to my own experience. When fresh, it is tuberous and cuts easily; grey, reddish-brown or brown externally, and white internally; taste mucilaginous; smell none. When dry, the root is much shrivelled, shrunken and wrinkled longitudinally; the epidermis is reddish-brown, brown or slightly ash-colored, and generally loose and peels off easily; beneath the epidermis the root is reddish brown, but white or pale-white internally; odorless and tasteless. The dry root is not easily powdered, but the dry slices of the fresh root are reduced to a fine powder without difficulty.

There is no drug in India which enjoys a greater reputation as an aphrodisiac and tonic in native medical works than the tap-root of the young plant of *B. malabaricum*. There is no doubt that it is one of the useful drugs in this country, but the exaggeration of its good effects in some of the above works is so great that it is quite ridiculous and not worth mentioning here. I have recently given a trial to this drug in my practice, and found it to be a good demulcent tonic and slightly aphrodisiac, but nothing beyond it. I may also state that even the good influence, which it does exert occasionally on the genital organs, is neither certain nor uniform. The great practical objection to the use of the *Sémal-músli* is that it is neither sold in the bazaar, nor procurable always in any garden or field. Besides, there is no medical property in it, which, according to my own experience, is not possessed with in equal degree, if not more, by the dry young fruits and bark of *B. malabaricum*. In fact, the *Maráti-moggu* is not only the cheapest and most abundant, but also the best and most useful of all the parts of the above plant which are used as medicines. The young fruits seem to possess some soothing or special action on the mucous membrane of the genito-urinary tract, and have therefore proved themselves more useful than Pareira Brava in some of the diseases in which the latter is indicated.

The bark, root-bark and roots of *B. malabaricum* contain a resinous substance, but the bark of the stem is much superior in this respect, and therefore preferable for the preparation of extract and decoction.

The bark of the stem or trunk varies much in appearance according to the age and size of the plant from which it is taken. That from the trunk of a well grown up tree after it begins to blossom is externally brown, rough; scaly and often covered with some short and blunt prickles; and internally reddish-brown. It is quite odorless and possesses no particular taste. The root bark is covered with a thin and ash-colored epidermis, and is deep or reddish-grey internally. It is also devoid of taste and smell.

The extract of *B. malabaricum* prepared in the manner described under the head of "*Preparations*," is dark in color and slightly saltish in taste, and odorless. The resemblance it bears to *Mócharas* is so great that if it is made to dry in any of the forms of the latter, it will certainly pass for it; but it does not keep dry permanently unless preserved in a stoppered bottle. It gets soft and moist as often as it is dried either by exposure to the sun or on the sand or water-bath. Its deliquescence and saline taste depend upon the large quantity of salt it contains.

‡ Eriodendron anfractuosum, *DC.* 116, 117 and 118.

Habitat.—One of the common trees in South India.

Parts Used.—The dry young fruit, cotton, and seeds.

Synonyms.—Of the dry young fruit—Suféd-séṅbal-ké-pindé, Suféd sémal-ké-pindé, Tóla-ké-pindé, *Hind.* *Ḳh*atyán-ké-pindé, Suféd-*Ḳh*atyán-ké-pindé, *Duk.* Ilavam-pinji, *Tam.* Búraga-pindé, Búra-saṇṇa-káya, Búraga-saṇṇa-káya, *Tel.* Of the cotton—Suféd-séṅbal-kí-rúí, Suféd-sémal-kí-rúí, Tólá-kí-rúí, *Hind.* *Ḳh*atyán-kí-rúí, Suféd-*Ḳh*atyán-kírúí, *Duk.* Ilavam-parutti, *Tam.* Búraga-patti, *Tel.* Pangai-maram-parutti, Pulla-maram-parutti, *Malyal.* Búra-mara-hatti, Buraga-hatti, *Can.* Tólá-rúí, *Beng.* Imbul-kapu, *Cing.* Of the seeds—Suféd-séṅbal-ké-bínj, Suféd-sémal-ké-bínj, *Hind.* *Ḳh*atyán-ké-bínj, Suféd-*Ḳh*atyán-ké-bínj, *Duk.* Ilvam-virai, *Tam.* Buraga-vittulu, *Tel.* Pangaivitta, Puḷa-maram-vitta, *Malyal.* Búra-mara-bíja, Búraga-bíja, *Can.* Tólá-bíj, *Beng.* Imbul-aṭṭa, *Cing.*

Local Sources.—The cotton is always found in the bazaar and is much cheaper than the common cotton. The dry young fruits are sometimes sold as *Máráṭi-moggu* in the local market, but what is generally met with there under this name are the dry young fruits of *B. malabaricum*, to which that name should be confined for the reasons explained under that plant. The fruits of *E. anfractuosum*, however, are found in a large quantity on the ground under the plant in the proper season, which is the chief and certain source of the drug. The seeds also require to be gathered in the proper season, not being sold in the bazaar.

Price.—Of the cotton—Wholesale, Rs. 2 per maund; retail or bazaar, As. 1½ per pound.

Physiological Actions, Therapeutic Uses, Preparations, Doses, and European Drugs for which they may be substituted.—Similar to those of the corresponding parts of *B. malabaricum*, except this, that the young fruit of the plant under discussion (*E. anfractuosum*) are much inferior as a drug to those of the former (*B. malabaricum*).

Remarks.—I have already described the dry young fruits of *E. anfractuosum* and pointed out the difference between them and those of *B. malabaricum* in my remarks under the latter plant, and refer the reader to them. The seeds of *E. anfractuosum* are about the size of a small pea, roundish, dirty or dull brown in color, and smooth. The albumen is grey or deep grey and distinctly sweet in taste. The cotton is of a dull or dirty white color, and more silky or softer than the common cotton. For this reason as well as for its cheapness it is preferable to the latter for medical purposes.

† Adansonia digitata, *Linn.* 119 and 120.

Habitat.—An African plant cultivated in various parts of India.

Parts Used.—The fruit (**No. 119**) and bark (**No. 120**).

Synonyms.—Of the fruit—The monkey-bread or baobab fruit, *Eng.* Góra-amlí, *Hind.* Górak-amlí-ká-phal, Háti-*Ḳh*atyán-ká-phal, *Duk.*

Anai-puḷi, Pappara-puḷi, Púri-puḷi, Símai-puḷi, *Tam.* Síma-chinta-paṇḍu, *Tel.* Góraka-ámlí, *Mah.* Gorak-amlí, *Guz.* Bíla-magi-ṣi, *Bur.* Hujéd, Ḥabḥabú, *Arab.* Of the bark—The monkey-bread bark or baobab bark, *Eng.* Gorak-amlí-kí-*chhál*, *Hind.* Hátí-*Kh*atyán-kí*chhál*, *Duk.* Anai-puḷi-paṭṭai, Papparap-puḷi-paṭṭai, Púri-puḷi-paṭṭai, Símai-puḷi-paṭṭai, *Tam.* Góraka-ámali-cha-paṭṭa, *Mah.* Górak-amlí-nuchálo, *Guz.* Bila-magi-ṣikháv, *Bur.* Qishrul-hujéd, Qishrul-ḥabḥabú, *Arab.*

Local Sources.—Not sold in the bazaar, but can be obtained easily and abundantly in the gardens of Madras.

Physiological Actions.—The subacid pulp of the fruit is astringent, refrigerant, demulcent, stomachic, anti-scorbutic and anthidrotic; and the bark is slightly antipyretic and antiperiodic.

Therapeutic Uses.—The pulp is useful in diarrhœa and dysentery generally as an adjuvant to other medicines, but in some very slight cases it effects a cure by itself. It is beneficial in pyrexia of any form of fever by diminishing the heat and quenching thirst. It has recently proved itself very successful in relieving the night-sweats and febrile flushes in a severe case of consumption. The bark is useful to some extent in simple and uncomplicated cases of continued and intermittent fevers, but to secure its good effects even to this extent, it must be employed in a very strong decoction, such as that described under head of *Preparations.*

Preparations.—Of the fruit—Powder and syrup. *Powder:* Remove the seeds, which are embedded in the pulp, by bruising in a mortar, and then reduce the pulp to a fine powder in the ordinary way with an equal quantity of sugar and keep it in a tightly closed bottle. *Syrup:* Take of the pulp, in powder, ten ounces; water, two pints; mix them well, strain the liquid through cloth, add thirty ounces of refined sugar and boil on a slow fire till it assumes the consistency of a syrup. Of the bark—Decoction: Take of the bark, cut into small pieces or in coarse powder, four ounces; water, two pints; boil till the liquid is reduced to one pint and strain when cool.

Doses.—Of the powder, from twenty grains to one drachm; of the syrup, from four fluid drachms to one fluid ounce; and of the decoction, from one to three fluid ounces; repeated as often as it is necessary according to the nature of each individual case.

European Drugs for which they may be substituted.—The pulp for diluted phosphoric and sulphuric acids, sweet nitre and effervescing draughts; and the bark for cinchona bark and Pulv. antimonialis.

Remarks.—The fruit is large and oblong, varying in length and circumference from 8 or 9 to 15 inches; externally it bears a great resemblance to velvet, being soft and downy, and is of greenish-brown color. The number of its cells varies from 6 to 10, but is generally 8; each cell is filled with a grey, sub-acid and farinaceous substance. The seeds, which are about half an inch in length and kidney-shaped, are embedded in the pulp. The acidity of the fruit is due to tartaric acid and bitartrate of potassium.

The bark is thick, light and covered with a thin greenish-brown epidermis, which is rough from wrinkles, &c., but not scaly; pale-brown internally, odorless and tasteless. It contains three per cent. of soluble and insoluble tannin, but no alkaloid or saponin.

The thick and very hard pericarp of the fruit is quite inert and does not possess any medicinal property, as is supposed by some native medical practitioners.

‡ Abutilon indicum, *G. Don.* 121 and 122.

Habitat.—One of the commonest plants in India.

Parts Used.—The leaves (**121**) and seeds (**122**) and bark.

Synonyms.—Of the leaves—Kangai-ká-pát, Kanghí-ká-pát, *Hind.* Kangói-ká-pattá, *Duk.* Tutti-ilai, *Tam.* Tutti-áku, Tutturu-benḍa-áku, *Tel.* Tutta-ela, Peṭṭaka-puṭṭi-ela, *Malyal.* *Sh*rímudri-yale, *Can.* *Jh*umká-ga*chh*-pátá, Piṭári-gá*chh*-pátá, *Beng.* Kangói-nu-pána, *Guz.* Anoda-kola, *Cing.* Bon-*kh*oye, *Bur.* Varqul-mashṭul-*gh*oul, *Arab.* Barge-dara*kh*te-shánah, *Pers.* Of the seeds—Kangai-ké-bínj, Kanghí-ké-bínj, *Hind.* Kangói-ké-bínj, *Duk.* Tutti-virai, *Tam.* Tutti-vittulu, Tutturu-benḍa-vittulu, *Tel.* Tutta-vitta, Peṭṭaka-puṭṭi-vitta, *Malyal.* *Sh*rimudri-bíja, *Can.* *Jh*umká-gá*chh*-bíj, Piṭárí-gá*chh*-bíj, *Beng.* Kangói-nu-bíj, *Guz.* Anoda-aṭṭa, *Cing.* Bazrul-mashṭul-*gh*oul, *Arab.* Tu*kh*me-dara*kh*te-shánah, *Pers.*

Local Sources.—The seeds are pretty common in the bazaar, but the leaves are not sold. As the plant is met with everywhere, the leaves can be gathered easily at any time.

Price.—Of the seeds—Wholesale, Rs. 4 per maund; retail or bazaar, As. 3 per pound.

Physiological Actions.—The leaves are emollient, and the seeds demulcent and slightly diuretic.

Therapeutic Uses.—The leaves contain some mucilaginous substance, which they yield to hot water. Their decoction is therefore useful as a fomentation to painful parts. The seeds have a distinct control over gonorrhœa, gleet and chronic cystitis.

Preparations.—Of the leaves—Decoction for external use, which is to be prepared by boiling the fresh leaves with water, in proportion of one handful of the former to one pint of the latter. Of the seeds—Simple powder, prepared in the ordinary way and kept in a corked bottle.

Doses.—Of the powder, from one to two drachms, three or four times in the twenty-four hours.

European Drugs for which they may be substituted.—Marsh-mallow, copaiba, uva ursi and buchu.

Remarks.—The seeds are small, being about a line in length and half a line in breadth and thickness; ash-colored when fresh, brown if old; somewhat kidney-shaped; odorless; taste mucilaginous.

STERCULIACEÆ.

* Theobroma Cacao, *Linn.* 123 and 124.

Habitat.—Central America. Cultivated in Ceylon.

Parts Used.—The seeds and oil.

Synonyms.—Of the seeds—Cocoa, cacao or chocolate seeds, *Eng.* Semence de cacao, *Fr.* Cacao samen, *Ger.* Kókó-ké-binj, *Duk.* Kókó-virai, *Tam.* Of the oil—Cocoa or cacao butter, Theobroma oil, *Eng.* Beurre de cacao, *Fr.* Cacao butter, Cacao talg, *Ger.* Kókó-ká-tél, *Duk.* Kókó-eṇṇey, *Tam.*

Local Sources.—The roasted and broken seeds (**No. 123**) are sometimes exported from Ceylon and sold by one or two native merchants at Madras. The chocolate and the different "prepared cocoas," however, which are well-known forms or preparations of the seeds, are plentiful in European and other shops in this city as well as in many other places in Southern India.

Price.—Of the roasted and broken seeds, Rs. 1½ per pound; of the chocolate, As. 10 per pound; and of the cocoa butter, As. 6 per ounce.

Physiological Actions.—Demulcent and nutritive.

Therapeutic Uses.—The seeds in the form of "prepared cocoa" have been found useful in phthisis pulmonalis. In dysentery and mucous diarrhœa, particularly when they are accompanied by tormina, tenesmus and extreme frequency of motions, it is one of the few best adjuvants to other and more active medicines, such as opium. The butter is a convenient base for suppositories and pessaries.

Preparations.—Of the seeds—Prepared cocoas are made by powdering the roasted seeds and removing a portion of the concrete oil by heat, and in the cheaper kinds sugar and farinaceous substances are added. Chocolate consists of the kernels of the seeds, which are first roasted, then deprived of their shells, and lastly reduced by grinding between heated stones into a paste, mixed with sugar and spices and pressed into cakes.

Doses.—Of the prepared cocoa, from one to two tea-spoonfuls.

Remarks.—The cocoa fruit or capsule (**No. 124**) is oval, from 2½ to 4 inches long and about the same in circumference, yellow and five-celled, each cell containing generally from 8 to 10 seeds. The seed is ovoid or oval, black and covered with a membranous and succulent aril.

The roasted and broken seeds (**No. 123**), which are exported to Madras from Ceylon, possess a very peculiar and pleasant odor and taste, which are sufficient to distinguish them from all other drugs and articles of diet. The odor is quite like that of chocolate, and the taste nearly so. The alkaloid of cocoa is theobromine, which is said to be identical in its effects on the system with theine or caffeine.

A very good description of Theobroma oil or cocoa butter is found in the *Pharmacographia*, p. 88, which is as follows:—

"At ordinary temperatures cacao butter is a light yellowish, opaque, dry substance, usually supplied in the form of oblong tablets, having somewhat the aspect of white Windsor soap. Though unctuous to touch, it is brittle enough to break into fragments when struck, exhibiting a dull waxy fracture. It has a pleasant odor of chocolate and melts in the mouth with a bland agreeable taste. Its sp. gr. is 0·961; its fusing point 29° to 30° C.

"Examined under the microscope by polarized light, cacao butter is seen to consist of minute crystals. It is dissolved by 20 parts of boiling absolute alcohol, but on cooling separates to such an extent that the liquid retains not more than 1 per cent. in solution. The fat separated after refrigeration is found to have lost most of its chocolate flavor.

"Cocoa butter in small fragments is slowly dissolved by double its weight of benzol in the cold (10° C.), but by keeping partially separates in crystalline warts."

‡ Sterculia fœtida, *Linn.* 125.

Habitat.—There are several plants in the gardens of Madras. Pretty common in Travancore.

Parts Used.—The seeds (**No. 125**) and oil.

Synonyms.—Of the seeds—Pínári-káy-virai, Pínári-virai, Kuddurai-puḍḍuku-káy-virai, *Tam.* Gurapu-bâdam-cheṭṭu-vittulu, *Tel.* Of the oil—Kuddurai-puḍḍaku-káy-eṇṇey, Pínári-káy-eṇṇey, Pínári-eṇṇey, *Tam.* Gurrapu-bádam-cheṭṭu-núne, *Tel.*

Local Sources.—Neither the seeds nor the oil is sold in the bazaar, but the former are procurable in some gardens at Madras in November and December, and the latter can be extracted from the kernel of the seeds.

Physiological Actions, Therapeutic Uses, Doses, and European Drugs for which they may be substituted.—Similar to those of the kernels of *Terminalia catappa.*

Remarks.—The seeds are black and oblong, about one inch in length, and about the same in circumference. The kernel is generally grey and sweetish in taste. The oil is of a pale yellow color, inodorous, with a faintly sweetish taste. The seeds afford as much as 40 per cent. of fixed oil which contains a large quantity of stearic acid.

‡ Helicteres Isora, *Linn.* 126.

Habitat.—Pretty common in Madras.

Part Used.—The fruit or capsule.

Synonyms.—Maṛóṛ-phallí, *Hind.* Maṛóṛí-kí-phallí, *Duk.* Valimbari-káy, *Tam.* Nuliti-káya, Syamili-káya, Aḍa-syamili-káya, Kávinchi-káya, Valimbari-káya, *Tel.* Valampari-káya, *Malyal.* Gasht-bar-gasht, *Pers.*

Local Sources.—Sold in some bazaars of Madras.

Price.—Wholesale, Rs. 3 per maund; retail or bazaar, As. 2 per pound.

Physiological Actions.—Demulcent and mild astringent.

Therapeutic Uses.—With other drugs in the griping of bowels and flatulence of children.

Preparation.—Simple powder prepared in the ordinary way.

Doses.—From one to two drachms, two or three times a day.

Remarks.—The fruit or capsule is cylindrical and pointed at one end, varying in length from 2 to 4 inches, and in thickness from 2 to 4 lines. It is spirally and handsomely twisted and possesses no particular taste or smell. The tree is sometimes called the East Indian screw tree.

‡ Guazuma tomentosa, *Kth.* 127.

Habitat.—Pretty common in Madras.

Part Used.—The bark.

Synonyms.—Bastard cedar bark, *Eng.* Bandóq-ḳé-jhár-kí-*chhál*, *Duk.* Tain-púchi-paṭṭai, *Tam.* Udrik-paṭṭa, *Tel.* Rudrakshi, *Can.*

Local Sources.—Not sold in the bazaar, but can easily be gathered from gardens and jungles.

Physiological Actions.—Tonic and demulcent.

Therapeutic Uses.—Used with benefit in some of those cases in which calumba and gentian are indicated.

Preparation.—Decoction: Take of the inner bark, cut into small pieces or in coarse powder, four ounces; water, one pint and a half; boil till the liquid is reduced to one pint, and strain when cool.

Doses.—From two to three fluid ounces.

European Drugs for which it may be substituted.—Calumba and gentian.

Remarks.—The bark is very scaly, but the scales are separated very easily when dry. The bark underneath the scales is reddish-brown, without any particular taste or smell. The bark is very mucilaginous and is used by arrack manufacturers in clarifying their liquors.

TILIACEÆ.

‡ Corchorus olitorius, *Linn.* 128.

Habitat.—A weed, cultivated in Bengal but not in Southern India.

Part Used.—The leaves.

Synonyms.—Jew's mallow, Jute leaves, *Eng.* Jangli-lông-ká-pattá, *Duk.* Punnák-kírai, Peratti-kírai, *Tam.* Parinṭa, Péranṭa, Péranṭa-kúra, *Tel.*

Local Sources.—Not sold in the bazaar; pretty common in hedges and fields.

Physiological Actions.—Demulcent, tonic and diuretic.

Therapeutic Uses.—Useful in some cases of chronic cystitis, gonorrhœa and dysuria.

Preparations.—Juice of the fresh leaves and infusion. The juice is to be pressed out by bruising the fresh leaves without water and passing through cloth. Infusion: Take of the dry leaves, three ounces; boiling water, one pint; infuse in a covered vessel for an hour and a half, and strain.

Doses.—Of the juice, from one to two fluid ounces; and of the infusion from two to four fluid ounces, three or four times in the twenty-four hours.

LINEÆ.

* Linum usitatissimum, *Linn.* 129 and 130.

Habitat.—Cultivated.

Parts Used.—The seeds **(129)** and oil **(130)**.

Synonyms.—Of the seeds—Linseed, flax-seed, *Eng.* Semence de Lin, *Fr.* Leinsamen, Flachssamen, *Ger.* Alsí, Tísí, *Hind.* Alsí-ké-bínj, *Duk.* Alishi-virai, *Tam.* Atasí. Madana-ginjalu, *Tel.* Cheṛu-cháṇa-vittinte-vitta, *Malyal.* Alashí, *Can.* Tísí, Mosína, *Beng.* Atasí, *Sans.* Bazrul-kattán or Bazrul-katán *Arab.* Tu*kh*me-katán, Tu*kh*me-za*gh*ir, *Pers.* Of the oil—Linseed oil, *Eng.* Alsí-ká-tél, Tísí-ká-tél, *Hind.* Alsí-ká-tél, *Duk.* Ala*sh*i-virai-eṇṇey, *Tam.* Atasí-núne, Madana ginjalu-núne, *Tel.* Cheru-cháṇa-vittinte-eṇṇa, *Malyal.* Alshi-eṇṇe, *Can.* Tísi-tail, *Beng.* Atasi-tailum, *Sans.* *Dh*onul-kattán or *Dh*onul-katán, *Arab.* Róg*h*ane-za*gh*ír, Róg*h*ane-katán, *Pers.*

Local Sources.—Both the seeds and oil are sold in the bazaar.

Price.—Of the seeds—Wholesale, Rs. 2½ per maund; retail or bazaar, As. 2 per pound. Of the oil, As. 12 per bottle. Of the linseed meal, As. 8 per pound.

Physiological Actions.—Demulcent, emollient, diuretic and nutritive.

The liniment of linseed oil, which is generally known as *Carron oil*, and sometimes as *Linimentum Calcis*, is a very useful preparation and is frequently and successfully resorted to, with cotton, for the cure of burns and scalds, and I have already explained the object of this combination in my remarks under the species of *Gossypium*, pp. 51 to 53.

Therapeutic Uses.—Internally, the seeds are very useful in relieving the burning sensation of the urine in dysuria, strangury, cystitis, nephritis and many other disorders of the bladder, kidney and urethra. Externally, in the form of poultice, they are not only useful in many surgical or external diseases, as ulcers, wounds, abscesses, carbuncles, &c., but also of great service in some internal and serious maladies, such as peritonitis, pneumonia, pleurisy, &c. Applied constantly over the abdomen or chest, &c., it relieves the inflammation of the deep-seated organs, and thus becomes a useful auxiliary to some internal and more active remedies.

Preparations.—Infusion, Poultice and Liniment. Infusion: Take of linseed, bruised, two drachms and forty grains; liquorice-root, sliced or bruised, one drachm; boiling water, ten fluid ounces; infuse the ingredients in the water in a covered vessel for four hours and strain. Poultice: The linseed poultice is prepared in two ways, one of which is described in the *Pharmacopœia of India*, p. 37. In this method, the linseed meal, which is nothing but the coarse powder of the oil-cake made from the seeds after expression of the oil, is used with olive oil and boiling water; and in the other, the seeds themselves, bruised or crushed, but not deprived of their oil, are employed alone with the boiling water. The linseed meal is very dear (As. 8 per

pound) and only procurable in European druggists' shops in Madras; while, on the other hand, the linseeds are very cheap (As. 2 per pound) and found abundantly in every bazaar. The dearness, together with the necessity of adding olive oil in the first method, makes the second very preferable in this country. Liniment: Take of linseed oil and Liquor Calcis in equal proportions, put them together in a bottle and shake till they are well mixed and become white.

Dose.—Of the infusion, from two to four fluid ounces.

European Drugs for which they may be substituted.—The linseeds and their oil in India are quite identical with those drugs produced in Europe, and they are, therefore, a perfect substitute for each other.

Remarks.—The seeds are small, flattened, oval or oblong, pointed at one extremity, sharp-edged, smooth, shining, brown or reddish-brown externally, yellowish-white internally, inodorous and of a mucilage-oily taste. They abound in a fixed oil, which is obtained from them either by expression or heat. The latter is the most common in South India, and is viscid, reddish or yellowish brown, with a peculiar and characteristic odour and taste.

† Erythroxylon monogynum, *Roxb.* (Sethia Indica, *DC.*) 131.

Habitat.—Dry jungles of the Western Peninsula.

Part Used.—The wood.

Synonyms.—Red cedar, Bastard Sandal, *Eng.* Nát-ká-dévdár, *Duk.* Tévadáram, *Tam.* Aḍvai-góranta, Dévadáru, Pagadapu-kaṭṭa, *Tel.*

Local Sources.—The wood is sold in the bazaars of Madras.

Price.—Wholesale, Rs. 3 per maund; retail or bazaar, As. 2 per pound.

Physiological Actions.—Stomachic, diaphoretic and stimulant diuretic.

Therapeutic Uses.—Useful in some slight cases of dyspepsia and continued fever, and also in dropsy as an adjuvant to some other and more active medicines.

Preparation.—Infusion: Take of the wood, in raspings or shavings, two ounces; boiling water, one pint; infuse one hour, strain and keep in a corked bottle.

Doses.—From one to two fluid ounces, as often as it is necessary.

European Drugs for which it may be substituted.—Anthemis, cascarilla and Pot. acet.

Remarks.—The wood is very hard, heavy, flesh-colored and almost tasteless, but has a strong aromatic and agreeable smell, particularly when freshly cut. The leaves are refrigerant and are eaten in times of famine.

MALPIGHIACEÆ.

Hiptage Madablota, *Gærtn.* 132.

Habitat.—Rather rare and found only in a few gardens of Madras.

Part Used.—The leaves and bark.

Synonyms.—Kurindai, *Tam.* Mádhavítégi, Vaḍla-yárála, Pótu-vaḍla, *Tel.* Má*dh*úbi, Má*ḍh*úbi-latá, Bos-anti, *Beng.*

Local Sources.—Not sold in the bazaar. Requires to be gathered whenever it is necessary.

Physiological Action.—Insecticide and astringent.

Therapeutic Uses.—The juice is useful in scabies by killing the *Acarus scabiei* if rubbed well and frequently over the affected parts. The bark contains tannin and is used by toddy drawers in making arrack.

Preparation.—Juice of the fresh leaves for external use is pressed out by bruising them without water.

European Drug for which it may be substituted.—Ungt. Hydrarg. Nitratis.

ZYGOPHYLLEÆ.

† Tribulus terrestris, *Linn.* 133 and 134.

Habitat.—One of the commonest herbs in all the jungles and waste places in India.

Parts Used.—The fruit (**No. 133**) and leaves (**No. 134**).

Synonyms.—Of the fruit—Gó*kh*rú, *Hind.* *Gh*ókrú, *Duk.* Nerunji-mullu, Neranji, *Tam.* Palléru-muḷḷu, Chiru-palléru, Palléru, *Tel.* Neringil, *Malyal.* Negalu, *Can.* Vanasrangánṭa, Gó*kh*urhá, Trikantakavallí, *Sans.* *Gh*ókaru, Charaṭṭe, *Mah.* Gó*kh*ru, *Beng.* and *Guz.* Neranchi or Neranji, *Cing.* Sule-anéṅ, *Bur.* Bastitáj, *Kh*asak, *Arab.* *Kh*áre-*sh*asak, *Pers.* Of the leaves—Gó*kh*rú-ká-pát, *Hind.* *Gh*ôkrú, ká-pattá, *Duk.* Nerunji-ilai, *Tam.* Palléru-áku, *Tel.* Neringil-ela, *Malyal.* Negalu-yalé, *Can.* Gó*kh*ru-pátá, *Beng.* Vanasarangaáṭ-patram, Gó*kh*urhá-patram, *Sans.* *Gh*ókaru-cha-pána, Charáṭṭe-cha-páno, *Mah.* Gó*kh*ru-nu-pándru, *Guz.* Neranchi-kola, *Cing.* Sule-anen-yœ, *Burm.* Varqul-bastí-táj, Varqul-*kh*asak, *Arab.* Bargekh-áre-*kh*asak, *Pers.*

Local Sources.—The dry fruit of *T. terrestris* is one of the commonest and cheapest drugs in the bazaar, but the leaves are not sold. As every jungle, plain and waste land is covered with this troublesome herb, there is no difficulty in gathering its fresh leaves whenever it is necessary.

Physiological Action.—Demulcent-diuretic.

Therapeutic Uses.—Useful in some slight cases of strangury, gleet and chronic cystitis.

Preparations.—Of the fruit—Decoction: Take of the dry fruit, bruised, three ounces; water, one pint and-a-half; boil on a slow fire till the liquid is reduced to one pint, strain when cool. Of the leaves—juice of the fresh leaves pressed out by bruising without water and passing through cloth.

Doses.—Of the decoction, from one to three fluid ounces; and of the juice, from one to two fluid ounces; four or five times a day.

European Drugs for which they may be substituted.—A weak substitute for Spirit. Æther. Nit., Tragacanth, Buchu and Uva Ursi.

Remarks.—The fruit is roundish, five-cornered, five-celled, about the size of the Bengal-gram, and armed with prickles, the great source of annoyance and pain to the foot-travellers. Each of the cells contains one or two four-horned seeds. The fruit possesses no particular taste or smell, but the seeds are slightly bitterish, due to the presence of an alkaloid.

GERANIACEÆ.

‡ Oxalis corniculata, *Linn.* 135.

Habitat.—Grows in every low and damp place, particularly along the banks of small and shallow nullas or brooks which are constantly wet.

Part Used.– The whole plant.

Synonyms.—Indian sorrel, *Eng.* Anbótí, Seh-pattí, *Hind.* Anbótí-kí-bhájí, *Duk.* Puḷiyárai, Puḷiyárai-kirai, *Tam.* Puli-chintáku, Pulla-chanchali, Anbótí-kúra, *Tel.* Puḷiyárala, *Malyal.* Puḷḷampurachí-sappu, *Can.* Omlóti, Amrul, *Beng.*

Local Sources.—It being one of those greens which the natives of this country, particularly the Muhammadans, are very fond of, it is sold in every town and large village.

Price.—As. 6 per viss, Rs. $1\frac{1}{2}$ per pound.

Physiological Actions.—Refrigerant and antiscorbutic.

Therapeutic Uses.—The fresh leaves bruised with or without water formed into a poultice and applied over an inflamed part, produce great cold and thus relieve the pain and other inflammatory symptoms. Prepared with hot water, the leaves make a very efficient poultice for boils. The leaves contain an acid oxalate of potash, and the sourish and very tasteful curry made from them improves the appetite and produces a relish for food. The greens are, therefore, a useful article of diet for some dyspeptic and other patients, in whom a dislike for food is a chief or constant symptom.

‡ Averrhoa Carambola, *Linn.* 136.

Habitat.—Cultivated.

Part Used.—The fruit.

Synonyms.—Ḳhamrak, Kamrak, *Hind.* Ḳhamraq, *Duk.* Tamart-tam-káy, *Tam.* Tamarta-káya, Tamma-káya, *Tel.* Tamarattu-ká, *Malyal.* Kamarak, *Can.* Kamarangá, Kamrak, *Beng.* Tamarak, *Guz.* Zounṣí, Zoun-yá-ṣí, *Burm.*

Local Sources.—The fruits of *Averrhoa Carambola* are sold in the bazaar in the rainy season.

Price.—Of the ripe fruit—Wholesale, Rs. $2\frac{1}{2}$ per maund; retail or bazaar, As. 3 per pound.

Physiological Actions.—Refrigerant and astringent.

Therapeutic Uses.—The ripe fruit, which is generally sour (though there is a sweet variety) and contains oxalic acid, is a good remedy for bleeding piles, particularly in that variety of the disease which is known

as internal piles. I have used it in several cases with more or less benefit, but in a few the result was very satisfactory, the bleeding disappearing rapidly and permanently. There is no doubt that the fruit will also produce a good effect in hæmatamesis, melæna and some other forms of hæmorrhage, but as it is not always procurable, I have not yet had an opportunity of trying it in those diseases. The fruit is also useful in relieving thirst and febrile excitement.

Preparations.—The juice of the ripe fruit or the fruit itself.

Doses.—Of the juice, from two to four drachms; and of the fruit, one if large, and two if small; two or three times a day.

European Drugs for which it may be substituted.—Hazeline, gallic acid, and phosphoric acid.

Remarks.—The ripe fruit is yellowish green, from 2½ to 3½ inches long, acutely 5-angled, each angle varying in breadth from ½ to 1 inch. It is very juicy, sour and abounds in acid oxalate of potash.

‡ Averrhoa Bilimbi, *Linn.* 137.

Habitat.—Cultivated extensively.

Part Used.—The fruit.

Synonyms.—Bilimbi fruit, *Eng.* Belambú, Bilimbi, *Hind.* and *Duk.* Koch-chit-tamarta-káya, Pulich-chakkáy, Bilimbi-káya, *Tam.* Pulusu-káyalu, Bili-bili-káyalu, Bilimbi-káyalu, *Tel.* Vilanbikká, Vilimbi, Karichakká, *Malyal.* Bilimbi, *Beng.* Bilambu, *Guz.* Kála-Zoun-ṣí, Kála-Zounya-ṣí, *Bur.*

Local Sources.—The ripe or half-ripe fruit being one of the vegetables which are most commonly used by the natives of this country in their curries, it is almost always found in the bazaar.

Price.—Wholesale, As. 12 per maund; retail or bazaar, Pies 6 per pound.

Physiological Actions.—Astringent, stomachic and refrigerant.

Therapeutic Uses.—The syrup of fruit is useful in relieving thirst, febrile excitement, and also in some slight cases of hæmorrhage from the bowels, stomach, and internal hæmorrhoids. The fruit itself, in the form of curry, is a useful dietary article in piles and scurvy.

Preparation.—Syrup: Take of the juice of the ripe fruit, strained through cloth, ten fluid ounces; refined sugar, thirty ounces; water, ten fluid ounces; mix and heat all the ingredients on a slow fire till the sugar is dissolved and the liquid assumes the consistence of a thick syrup.

Dose.—From three to six fluid drachms, well diluted with water, four or five times in the twenty-four hours.

European Drugs for which it may be substituted.—Gallic acid, phosphoric acid and effervescing draughts.

Remarks.—The fruit is pale or yellowish green, oblong, from 1½ to 2½ inches in length, from ½ to 1 inch in thickness, obtusely 5-angled and sour in taste. The acidity of this fruit, like that of the preceding plant, depends upon the acid oxalate of potash. The quantity of this salt, however, is much larger in the latter than in the former.

RUTACEÆ.

*** Ruta angustifolia,** *Pers.* A variety of **R. graveolens,** *Linn.* **138.**

Habitat.—Cultivated in many gardens for medicinal purposes.

Part Used.—The leaves.

Synonyms.—Rue leaves, *Eng.* Sadáb, Sadáb-ká-pát, *Hind.* Sadáf, Sadáf-ká-pattá, *Duk.* Arvadá, Arvadá-ilai, Sadápa-ilai, *Tam.* Sadápa, Sadápa-áku, Arudu, Arudu-áku, *Tel.* Nágadáḷi-sappu, Nágadáḷi-yalé, *Can.* Sadápa*ha*, *Sans.* Sadáp, Sitáp, *Guz.* Aruda, *Cing.* Faijan or Féjan, *Arab.* Sudáb, *Pers.*

Local Sources.—Both the fresh and dry leaves are sold in the bazaar.

Price.—Wholesale, Rs. 2½ per viss; retail or bazaar, Re. 1 per pound.

Physiological Actions.—Stimulant, carminative, stomachic, antispasmodic and emmenagogue.

Therapeutic Uses.—The dry rue leaves in the form of infusion and tincture are more useful in adults than in children, but the effect of the juice of fresh leaves is just the reverse. The former preparations are beneficial in dyspepsia with flatulency, flatulent colic and slight cases of amenorrhœa; and the latter (the juice) has a distinct control over infantile convulsions, particularly in combination with *Gáiróhan* (gall-stone or biliary concretion of a cow or bullock). See remarks under the head of Bezoar or Animal-bezoar.

Preparations.—Infusion, tincture and the juice of fresh leaves. Infusion: Take of the rue leaves, dried, ten drachms; boiling water, one pint; infuse in a covered vessel for two hours, and strain. Tincture: Take of the leaves, in coarse powder, ten drachms; proof spirit, ten ounces; macerate the powder for seven days in seven ounces of the spirit in a closed vessel, agitating occasionally; then transfer to a percolator, and when the fluid ceases to pass, continue the percolation with the remaining three ounces of the spirit, and add more, if necessary, to make ten ounces. Fresh juice: Press out the juice by bruising the fresh leaves without water.

Doses.—Of the infusion, from an ounce and a half to three fluid ounces; of the tincture, from one to three fluid drachms; and of the fresh juice for children under six years, from a tea to a dessert spoonful, three or four times in the twenty-four hours.

European Drugs for which they may be substituted.—Sp. Ammon. Aromat., Ol. Anisi, Tinct. Cascarillæ, Tinct. Valerianæ, and Pil. Rhei Co.

Remarks.—The rue leaves are very small, being about two to three lines in length; oval; possess a bitter and nauseous taste; and a heavy, aromatic and slightly disagreeable smell. The latter is sufficiently peculiar to distinguish the leaves from all other drugs of similar appearance. The essential oil of rue (*Oleum rutæ*) is not sold in the bazaar, but is procurable in every European medicine shop at Madras. I have not yet used it in my practice, and cannot, therefore, say anything

about its use from my own experience and knowledge. I refer the reader to the explanation of its medical properties, &c., in the *Pharmacopœia of India*, p. 40.

* Toddalia aculeata, *Pers.* 139.

Habitat.—Common in the jungles of Southern India, particularly on the Coromandel and Malabar coasts and the Nílgiris.

Part Used.—The root-bark.

Synonyms.—Bark of the Indian Lopez root, *Eng.* Janglí-kálí-mir*ch*-kí-jaṛ-kí-*chh*ál, *Hind.* Janglí-kálí-mir*ch*í-kí-jaṛ-kí-*chh*ál, *Duk.* Miḷakaṛn*ai*-vér-paṭṭai, *Tam.* Mirapa-kándra-véru-paṭṭa, Kondakasinda-véru-paṭṭa, *Tel.* Toṭali-véra-tóla, Kákka-toṭali-véra-tóla, *Malyal.* Kudu-mirish-múl-potta, *Cing.*

Local Sources.—One of the cheapest drugs in the local market.

Price.—Wholesale, Rs. 2½ per maund; retail or bazaar, As. 2 per pound.

Physiological Actions.—Antiperiodic, antipyretic, diaphoretic, carminative and tonic.

Therapeutic Uses.—The root-bark is of the greatest service in all the varieties of idiopathic and uncomplicated intermittent, remittent and simple continued fevers; and also very useful in atonic dyspepsia and in debility from whatever cause.

Preparations.—Decoction, tincture, watery-extract, and simple powder. Decoction: Take of the root-bark, in coarse powder, six ounces; water, two pints and a half; boil on a slow fire till the liquid is reduced to one pint and strain when cool. Tincture: Take of the root-bark, in coarse powder, six ounces; proof spirit, one pint; macerate for seven days in a closed vessel with occasional agitation, filter and add more spirit to make one pint. Watery-extract: Take of the root-bark, in coarse powder, one portion; water, six portions; boil till the liquid is reduced to one-third; strain the latter through cloth while hot and evaporate it on a sand-bath to the consistence of an extract. Simple powder: The root-bark pulverized in the ordinary way after scraping off the corky epidermis, and passed through a fine sieve or cloth.

Doses.—Of the decoction, from two to six fluid ounces; of the tincture, from two to four fluid drachms; of the watery-extract, from forty to eighty grains; and of the simple powder, from one to two drachms.

European Drugs for which they may be substituted.—For quinine and other alkaloids of cinchona, as an antiperiodic; for Warburg's tincture, antipyrin, antifebrin, phenacetin and Pulv. Jacobi Vera, as a diaphoretic and antipyretic; and for gentian and calumba, as a tonic.

Remarks.—I have been using the root-bark of *T. aculeata* in my practice during the last twelve or thirteen years, and do not hesitate in saying that it is one of the most valuable drugs in India. It is, as antiperiodic and antipyretic, equal, if not superior, to quinine and other alkaloids of cinchona and to Warburg's tincture, respectively; and, as a

diaphoretic, decidedly more efficacious than Pulv. Jacobi Vera or James' powder, and a few other antipyretic medicines mentioned above. It, therefore, demands an especial notice of the medical profession.

The root and root-bark are sold together in the bazaars of Madras, but the former can be easily removed, it being generally in a very small proportion. The root-bark occurs in hollow pieces, varying in length from 2 to 5 inches, and in thickness from $\frac{3}{4}$ to $1\frac{1}{2}$ lines. It is more or less flexuous, often partially quilled, and covered with a yellowish corky epidermis. It possesses no particular odor, but is bitter in taste. In the fresh state it is aromatic and pungent and has an odor of citron.

Of all the preparations of this drug above described, the tincture and decoction are the most useful, and the rest (the extract and powder) are inferior and unsatisfactory in their action. I make the tincture and decoction very strong, and this, together with the very large doses in which I use them in my practice, is apparently the chief cause of their great success in my hands.

Six drachms of the tincture or twelve ounces of the decoction of *T. aculeata* are equal to one bottle of Warburg's tincture; and if either of them is used in two doses during the presence of simple continued fever or a paroxysm of ague, it produces the same good effect as the latter drug (Warburg's tincture), namely, a copious perspiration and relief of the febrile condition; and, again, if the tincture or decoction is repeated in the same dose during the interval of ague, every fourth or fifth hour, for two or three days, it prevents the return of paroxysm as successfully as very large doses of quinine. To render the cure more perfect and complete, the tincture or decoction should be continued in smaller doses for four or five days more. The beneficial influence of the tincture or decoction of *T. aculeata* in remittent fever is precisely the same, and the only difference is that it sometimes relieves the exacerbation and checks its return at once; and at others, it first converts the remittent into intermittent fever and then cures the latter in the same way as explained above. Out of the many severe and very obstinate cases of malarious, jungle and other fevers, which yielded to this drug, there were several in which quinine with arsenic was first tried and failed. As the dose of the tincture of *T. aculeata* is much smaller than that of its decoction, and as it can also be prepared and kept always ready for use, it is preferable to the latter; but there is no difference whatever between the medical properties of both preparations.

The root-bark of *T. aculeata* is not only much cheaper than quinine and Warburg's tincture, but is also one of the cheapest drugs in Southern India, its price being only about 2 annas per pound. In addition to this, its advantages over quinine are that it, unlike the latter, can be freely and successfully administered in the absence as well as in the presence of fever; and that however long and frequently it may be employed, it never produces ringing in the ear, deafness and some other disagreeable symptoms which are so commonly observed in the use of quinine.

The analogy between the medical properties of the root-bark of *T. aculeata* and those of the root of *Berberis Asiatica* and some other species of *Berberis* is very great. The former, however, has one advantage over the latter, which is its procurability in every large bazaar of

Southern India; whereas, the Indian Barberry-root requires to be sent for from some hills and distant places, as the Nílgiris, Shevaroy Hills, Calcutta, Delhi, &c.

† Murraya Kœnigii, *Spr.* (Bergera Kœnigii, *Linn.*) 140.

Habitat.—Cultivated in some gardens.

Part Used.—The leaves.

Synonyms.—Curry-leaf tree, *Eng.* Karé-pák, Karyá-pák, Karyá-pát, *Duk.* Kari-véppilai, Kari-vémbu, *Tam.* Kari-vépa, *Tel.* Kari-véppa, Kariya-pála, *Malyal.* Kari-bévana-yelé, *Can.* Barsungá, *Beng.* Surabhí-nimba-patram, *Sans.* Karépáka-cha-pána, *Mah.* Kare-pák-nu-pándro, *Guz.* Karri-pincha, *Cing.* Pído-ṣin or Pindo-ṣin, *Bur.*

Local Sources.—Sold in the bazaar, and also by some village women in the streets.

Price.—Wholesale, Rs. 3 per maund; retail or bazaar, As. 2½ per pound.

Physiological Actions.—Stimulant and carminative.

Therapeutic Uses.—Useful in some slight cases of dyspepsia.

Preparation.—Infusion: Take of the dry leaves, ten drachms; boiling water, one pint; infuse for an hour in a covered vessel, and strain.

Doses.—From one fluid ounce and a half to three fluid ounces.

Remarks.—The curry leaves are used all over India as a condiment, and the tree is called in Sanskrit the fragrant neem. The leaves contain a volatile oil, a resin and a glucoside.

* Citrus Aurantium, *Linn.* 141.

Habitat.—Cultivated extensively.

Parts Used.—The dried outer portion of the rind of the fruit (**No. 141**) and flowers.

Synonyms.—Of the rind of the fruit—Orange peel, *Eng.* Nárangí-ké-*ch*hilté, *Hind.* and *Duk.* Kich-chilip-pazham-tól or Kich-chili-paṛam-tól, *Tam.* Kich-chili-pandu-tólu, Kamala-phala-tólu, Nárija-pandu-tólu, Kittaḷi-pandu-tólu, Náranga-pandu-tólu, *Tel.* *Madh*úra-náranga-tóli, *Malyal.* Nárungi-*ch*ilká, Komolá-nébu-chilka, *Beng.* Náringa-cha-chilṭo, *Mah.* Náringi-nu-chilká, *Guz.* Qishrul-náranj. *Arab.* Póste-nárang, *Pers.* Of the flowers—Orange flowers, *Eng.* Náringí-ke-phúl, *Hind.* and *Duk.* Kich-chilip-pazham-pú or Kich-chilip-paṛam-pú, *Tam.* Kich-chili-pandu-puvvu, Kamala-phala-puvvu, Nárinja-pandu-puvvu, Kittaḷi-pandu-puvvu, *Tel.* Madhura-náranga-pu*sh*pam, *Malyal.* Nárungi-phúl, Komola-nébu-phúl, *Beng.* Naringa-cha-phúla, *Mah.* Náringi-nu-phúlá, *Guz.* Vardul-náranj, *Arab.* Gule-nárang, *Pers.*

Local Sources.—The dried orange peel and flowers are sold in some bazaars of Madras.

Price.—Of the orange peel—Wholesale, Rs. 3 per maund; retail or bazaar, As. 3 per pound. Of the orange flowers—Re. 1 per pound.

Physiological Actions, Therapeutic Uses, Preparations and Doses.—I have nothing more to add from my own experience and knowledge to the information given under the above heads in the *Pharmacopœia of India*, and therefore refer the reader to that work, pp. 42 and 43.

* Citrus acida, *Roxb.* 142.

Habitat.—Cultivated extensively.

Parts Used.—The outer portion of the rind of the fruit (**No. 122**), juice of the ripe fruit, and a crystalline acid prepared from the juice.

Synonyms.—Of the rind of the fruit—Lime peel, *Eng.* Límú-ké-*chh*ilṭé, *Hind.* Níṁbú-ké-*chh*ilṭé, *Duk.* Elumi*ch*-*ch*am-pazham-tól or Elumi*ch*-*ch*am-paṛam-tól, *Tam.* Nimma-panḍu-tólu, *Tel.* Cheṛu-náranga-tóli, Jonakam-náranga-tóli, *Malyal.* Nimbe-haṇṇu-tólu, *Can.* Nébu-chilká, *Beng.* Limbú-cha-chilṭo, *Mah.* Nímbu-nu-chilka. *Guz.* Qishrul-límú, *Arab.* Póste-límú, *Pers.* Of the juice of the fruit—Lime juice, *Eng.* Límú-ká-ras, *Hind.* Níṁbú-ká-ras, *Duk.* Elumi*ch*-*ch*am-pazham-rasam or Elumi*ch*-*ch*am-paṛam-rasam, *Tam.* Nimma-panḍu-rasam, *Tel.* Nébu-ras, *Beng.* Limbú-cha-ras, *Mah.* Nimbú-nu-ras, *Guz.* Mául-limú, *Arab.* Abe-límú, Shérai-límú, *Pers.* Of the crystalline acid—Citric acid, *Eng.* Acide citrique, *Fr.* Citronensaüre, *Ger.* Límú-ká-jouher, Límú-ká-turshábah, *Duk.*

Local Sources.—Neither the lime peel nor the lime juice is sold separately, but the fresh and ripe lime is commonly met with almost in every bazaar of India. As the lime juice contains a larger quantity of citric acid than the juice of lemon, and as much of the article imported into England under the name of lemon juice is considered to be obtained from the lime, the latter is the chief source of the above acid.

Price.—Of the fresh and ripe fruit—Wholesale, Rs. 3 per thousand; retail or bazaar, Pie 1 for each.

Physiological Actions, Therapeutic Uses, Preparations and Doses.—Quite similar to those described under the articles "*Citrus Limonum*" and "*Citrus Bergamia*" in the *Pharmacopœia of India*, pp. 43 to 46.

‡ Citrus medica, *Linn.* 143.

Habitat.—Cultivated.

Parts Used.—The outer portion of the rind of the fruit (**No. 143**) and the juice of the ripe fruit.

Synonyms.—Of the rind of the fruit—Citron peel, *Eng.* Turanj-ké-chilṭe, *Hind.* and *Duk.* Narttam-pazham-tól or Narttam-paṛam-tól, *Tam.* Dabba-panḍu-tólu, Nára-dabba-panḍu-tólu, Mádhipala-panḍu-tólu, Bíjapúra-panḍu-tólu, Pulla-dabba-panḍu-tólu, Lungamu-panḍu-tólu, *Tel.* Ganapati-náraṇṇa-tóli or Ganapati-nárangá-tóli, *Malyal.* Mádaḷada-haṇṇu tólu, *Can.* Turanj-chiká, Hónsa rébu-chiká, *Beng.* Turanj-cha-chilṭo, *Mah.* Bíjóra-nu-chilká, Bálank-nu-chilká, *Guz.* Qishrul-utraj or Qishrul-utraj, *Arab.* Póste-turanj, *Pers.* Of the juice of the fruit—Citron juice, *Eng.* Turanj-ká-ras, *Hind.* and *Duk.* Narttam-pazham-rasam or Narttam-paṛam-rasam, *Tam.* Dabba-panḍu-rasam, Nára-dabba-panḍu-rasam, Mádhipala-panḍu-rasam, Bijapúra-

Local Sources.—The ripe fruit is sold in all the large bazaars of India.

Price.—Wholesale, Rs. 4 or 5 per hundred; retail or bazaar, As. 2 or 3 for each.

Physiological Actions.—The rind of the fruit is stomachic; and the juice in the form of syrup is refrigerant, antalkaline, antiscorbutic, and stomachic.

Therapeutic Uses.—The infusion of the fresh rind is useful in some slight cases of dyspepsia, and the syrup is a good remedy in scurvy, febrile affections, and in atonic and some other forms of dyspepsia.

Preparations.—Infusion and Syrup. Infusion: Take of the outer portion of the fresh rind (previously separated from most of its white and spongy internal portion), in small pieces, four ounces; boiling water, one pint; infuse in a closed vessel for an hour and strain. Syrup: Take of the juice of citron, strained, one pint; refined sugar, two pounds and a quarter; mix and heat till the sugar is dissolved and the liquid assumes the thickness of a syrup.

Doses.—Of the infusion, from two to four fluid ounces; and of the syrup, from half to one fluid ounce, three or four times in the twenty-four hours.

† Feronia Elephantum, *Corr.* **144, 145, 146, 147** and **148.**

Habitat.—Cultivated, and also found wild in some jungles in South India.

Parts Used.—The gum (**Nos. 144, 145** and **146**), fruit (**No. 147**) and leaves (**No. 148**).

Synonyms.—Of the gum—Feronia gum or Wood-apple gum, *Eng.* Kaṭbél-kí-gónd, *Hind.* Kavíṭ-ká-gónd, *Duk.* Viḷám-piṣhin, *Tam.* Velaga-banka, Kapitthamu-pisunu, *Tel.* Viḷám-paṣha, *Malyal.* Byálada-góndú, *Can.* Kóth-bél-gun, Káṭ-bél-gun, *Beng.* Kapidtha-niryásam, *Sans.* Kavíṭa-gónda, *Mah.* Kaviṭ-gón, *Guz.* Divul-melliyam, *Cing.* Ti-sí, *Bur.* Samaghe-kabít, *Arab.* and *Pers.* Of the fruit—Wood-apple, *Eng.* Kaṭ-bél, *Hind.* Kavíṭ, *Duk.* Viḷám-pazham or Viḷám-paṛam, *Tam.* Velaga-panḍu, Kapidh-dhamu, *Tel,* Viḷám-paṛam, *Malyal.* Byálada-haṇṇu, *Can.* Lóth-bél, Kaṭbél, *Beng.* Kapidtha-phalam, *Sans.* Kavíṭa, *Mah.* Kavíṭ, Kóṭhu, *Guz.* Divul, *Cing.* Ti-di, *Bur.* Kabít, *Arab.* and *Pers.* Of the leaves—Wood-apple leaves, *Eng.* Kaṭ-bél-ké-pát, *Hind.* Kavíṭ-ké-patté, *Duk.* Viḷám-ilai, *Tam.* Velaga-áku, Kapidh-dhamu-áku, *Tel.* Viḷám-ela, *Malyal.* Byálada-yale, *Can.* Kóth-pátá, Kaṭbél-pátá, *Beng.* Kapidtha-patram, *Sans.* Kavíṭapána, *Mah.* Kavíṭ-pánḍru, Kóṭhu-panḍru, *Guz.* Divul-kóla, *Cing.* Ti-yae, *Bur.*

Local Sources.—The gum is found in some large bazaars of Madras; the ripe fruit is sold abundantly in all the towns and large villages of India; and the leaves can be easily gathered whenever they are needed, the plant being pretty common in this country.

Price.—Of the best variety of the gum (**No. 144**)—Wholesale, Rs. 8 per maund; retail or bazaar, As. 7 per pound. Of the ripe fruit—Wholesale, As. 6 per hundred; retail or bazaar, Pie 1 for each large fruit.

Physiological Actions.—The gum is demulcent and emollient; the ripe fruit stomachic and refrigerant; and the leaves carminative and stomachic.

Therapeutic Uses.—The gum is useful in the same diseases and for the same purposes as those in which the Gum Arabic is employed; the fruit is used with advantage in dyspepsia and in quenching thirst in febrile conditions; and the leaves are also administered with benefit in some slight cases of dyspepsia.

Preparations.—Of the gum—Mucilage, which is prepared in the same manner as the mucilage of the Indian Gum Arabic described under the heading of *Preparations*, in the article of Acacia Arabica. Of the fruit—Syrup: Take of the pulp of the ripe fruit, ten ounces; mix well in thirty ounces of water and strain through cloth; add twenty ounces of refined sugar to the strained liquid, and apply heat till the sugar is dissolved and the liquid assumes the consistence of a thick syrup. Of the leaves—Infusion: Take of the fresh leaves, three ounces; boiling water, one pint; infuse in a closed vessel for two hours and strain.

Doses.—Of the mucilage, from two to four fluid ounces; of the syrup, from four fluid drachms to one fluid ounce; and of the infusion, from two to four fluid ounces; three or four times in the twenty-four hours.

European Drugs for which they may be substituted.—The gum for the Gum Arabic and Tragacanth imported from Europe; the syrup for effervescing draughts, diluted phosphoric and sulphuric acids; and the leaves for Dill and Anise.

Remarks.—The gum of *Feronia Elephantum* occurs in small roundish, oblong or tapering tears, or in broken pieces, varying in size from a pea to a soap-nut; generally colorless and transparent, sometimes opaque with numerous minute cracks on the surface; odorless, bland and mucilaginous in taste. This gum is very frequently confounded with the Indian Gum Arabic, for it not only bears a great resemblance to it, but there is also a great similarity between the pronunciation of the Tamil names of both, the former being called "*Vilàmpishin*," and the latter "Vélam-*pishin*." Feronia gum being rather scarce and comparatively very dear, the native druggists take advantage of the above facts, and generally pick out the whiter and more transparent pieces from the Indian Gum Arabic and sell for the former. The only ready and practical difference between these gums is that the gum of *F. Elephantum* is invariably much whiter and more transparent than that of *Acacia Arabica*. The two gums are said to be chemically different, but they make equally good and adhesive mucilages.

The fruit of *F. Elephantum* or wood-apple is invariably globular with a hard, dull-white, greenish-white or ash-colored rind, and varies in size generally from a small orange to a middle-sized pomegranate. It is one-celled with a large five-lobed cavity, which contains a reddish brown and sub-acid pulp. On account of its cheapness, the wood-apple is often used for adulteration with the bael-fruit, but the difference between them is so great that they can be easily distinguished from each other. (*See remarks under Ægle Marmelos.*)

Feronia Elephantum, *Corr.* **149.** The small variety.

Habitat.—Not cultivated, but found growing in many jungles and edges.

Part Used.—The leaves **(No. 149)**.

Synonyms.—Bhúíṅ-kaṭ-bél-ké-pát, *Hind.* Bhúíṅ-kavíṭ-ké-patté, *Duk.* Kuṭṭi-viḷám-ilai, Nila-viḷám-ilai, *Tam.* Néla-velaga-áku, *Tel.* Bhukapidtha-patram, *Sans.*

Local Sources.—The leaves are not sold in the bazaar, but require to be gathered if necessary.

Physiological Actions, Therapeutic Uses, Preparations, Doses and *European Drugs for which it may be substituted.*—Quite similar to those of the leaves of the preceding plant.

Remarks.—From the very small size of this plant, which is seldom more than three feet in height, it is considered by some to be a different species. The difference in size, however, is not sufficient to constitute a distinct species, and as the plant does not differ in any other respect from *F. Elephantum* or *Wood-apple tree*, it is only a variety of the latter. The leaves of the small variety are generally more efficacious than those of the large or common variety, and I have, therefore, treated it separately.

* **Ægle Marmelos,** *Correa.* **150, 151, 152, and 153.** The small or common variety.

Habitat.—Common in South India. Often cultivated near pagodas, it being one of the sacred trees of the Hindus.

Part Used.—The pulp of the fruit.

Synonyms.—Of the fruit **(Nos. 152 and 153)**—The small or common variety of Bael-fruit or Bengal-quince, *Eng.* *Chhóṭe*-qisam-ká bél*phal*, *Hind.* and *Duk.* *Ṣhiṛiya*-vilva-pa*zh*am or *Ṣhiṛu*-vilva-paṛam, *Tam.* Chinna-bilva-panḍu, Chinna-maréḍu-panḍu, *Tel.* Cheṛiya-kúvalap-paṛam, *Malyal.* Saṇṇa-bilva-haṇṇu, *Can.* *Choṭa*-bél, *Beng.* Lahana-bélácha-*phalá*, *Mah.* Nánu-bílinu-*phal*, *Guz.* Punji-bélli, *Cing.* A*ngén*-ou*shi*-ṣi, *Bur.* *Sh*ule-*kh*urd, Balá*ghḥú*ne-*kh*urd, *Pers.* Safarjale-hindíe-ṣa*ghḥir*, *Arab.* Of the pulp **(Nos. 150 and 151)**—The pulp of the small or common variety of bael-fruit, *Eng.* *Chhóṭe*-qisam-ké-bél-*phal*-ka-ma*ghḥz*, *Hind.* and *Duk.* *Ṣhíṛu*-vilva-paṛam-sadai, *Tam.* Chinna-bilva-panḍu-kanḍa, *Tel.* Ma*ghḥze*-shule-*kh*urd, Ma*ghḥze*-balá*ghḥú*ne-*kh*urd, *Pers.* Ma*ghḥze*-safarjale-híndíe-ṣa*ghḥír*, *Arab.*

Local Sources.—The dry broken or entire fruits are always met with in the bazaar, but the dry pulp is very seldom sold separately. The pulp in the entire fruits is spoiled very soon, and they should not therefore be purchased for medicinal purposes without being broken and examined.

Price.—Of the dry broken fruit—Wholesale, Rs. 2 per maund; retail or bazaar, As. 1½ per pound.

Physiological Actions.—The pulp is stimulant, stomachic, antipyretic, antiscorbutic, and possesses a beneficial influence over the membrane of the alimentary canal.

Therapeutic Uses.—The pulp of the fruit has proved very useful in my hands in dysentery, diarrhœa, aphthæ, land-scurvy and some continued fevers. I have generally used it in the forms of powder and syrup. The pulp of the ripe fruit is more suited for the syrup, and

that of the half-ripe for the powder. The powder, again, is more useful in acute diseases, and the syrup in the chronic. In acute dysentery the powder is required to be employed in much larger doses than in any other disease. The first good effect of the powder in acute dysentery is generally the disappearance of blood and a proportionate increase of the fæculent matter in evacuations. In fact, the powder seems to have more power in altering the nature of the dysenteric motions than in reducing their number. To check the frequency of evacuations, the powder generally requires the combination of opiates or some other astringent medicines. The powder and syrup, particularly the former, are also very useful in relieving the febrile condition in some forms of continued fever, including the hectic and typhoid. The abnormal temperature is reduced under its use in a remarkable manner and deserves particular attention.

Preparations.—Powder and Syrup—Powder: The pulp being first prepared and dried in the manner described under the heading of "*Remarks,*" it is reduced to a fine powder in the usual way and kept in a closed vessel. Syrup: Take of the dry pulp, five ounces; soak it in two pints of water for a few hours or till it becomes soft; rub it well with the hand and strain the liquid through cloth up to one pint; add to the latter fifteen ounces of refined sugar, and heat it till it acquires the consistency of a thick syrup. When the syrup is prepared from the pulp of the large or cultivated variety of bael-fruit, the quantity of sugar required is only ten ounces.

Doses.—Of the powder, as a remedy in dysentery, from twenty to forty-five grains; and for all other purposes, from ten to twenty grains; four, five or six times in the twenty-four hours. Of the syrup, from four fluid drachms to one fluid ounce, every third or fourth hour. The small or common variety of bael-fruit being, as a medicine, stronger than the larger or cultivated variety, the dose of its powder should always be less than that of the latter by one-third.

Remarks.—There are two varieties of *Ægle Marmelos*, the small or common, and the large or cultivated. There is no distinct difference between the medical properties of both varieties, except that the fruit of the small or common variety, which is described in every botanical work in this country, is much stronger, as a drug, than that of the large or cultivated variety. The large or cultivated variety differs from the small or common one in the following points:—

Generally free from spines; leaflets broadly and abruptly acuminate instead of oblong or broadly lanceolate, and when bruised, have an agreeable and aromatic odor; fruit eatable and delicious when quite ripe, almost invariably globular, generally two or three times larger than that of the small or common variety, and sometimes attains the size of a small child's head.

The pulp of the ripe and half-ripe fruit of both varieties is the best and most useful part of the plant for medicinal purposes. The pulp should be removed from the rind before the fruit is dry, cut into small pieces and dried in the sun. The pulp of the ripe fruit of the large variety is first of flesh color, but gradually becomes dark-brown; it has an agreeable and aromatic odor and a terebinthinate and sweetish taste. It is not destroyed by keeping. However old it may be, if soaked in water for some hours, it becomes as soft as it is when fresh, and still retains its characteristic smell and taste.

From its greater abundance and cheapness, the Wood-apple (*Feronia Elephantum*) is occasionally substituted for the Bael-fruit in the bazaar when the latter is sold in large quantities; but there will be no difficulty in distinguishing them from each other if the following distinctions be attended to :—

Bael-fruit of both varieties.	*Wood-apple.*
1. Generally roundish, ovoid or obovate, and sometimes oblong.	1. Almost always round or spherical.
2. Generally about the size of a large orange, often as big as a large pomegranate, and sometimes attains the size of a small child's head.	2. Generally about the size of an orange, and often as large as a pomegranate.
3. Greenish or yellowish brown in color, smooth and slightly shining.	3. Greenish white or ash colored, neither smooth nor shining.
4. Rind very hard, woody and thin.	4. Rind hard, woody, and though somewhat thicker, yet more easily broken.
5. In the centre of the pulp there are from five to eighteen small cells, each of which contains some mucus, and from one to twelve or more seeds. (In the small variety of bael-fruit, the seeds are often absent in some cells.)	5. No cells at all, and the seeds are numerous and embedded in the pulp. A fruit contains about 500 seeds.
6. The seeds are oblong, flat or compressed, woolly, and about the size of a lime-seed.	6. The seeds are generally about the same shape, but one-half smaller in size.
7. The mucus is thick, very tenacious, transparent, and strongly terebinthinate in smell and taste.	7. Contains no mucus, but is acid from the presence of citric acid.
8. When the fruit is quite ripe, the pulp is of a brownish red or reddish yellow color with a strong balsamic odor and sweetish taste.	8. In the same condition, the pulp is of a reddish grey or flesh color, with a very agreeable and slightly aromatic odor and sub-acid taste.

‡ **Ægle Marmelos,** *Correa.* **154, 155, and 156.** The large or cultivated variety.

Habitat.—Cultivated in many gardens.

Part Used.—The pulp of the fruit.

Synonyms.—Of the fruit **(No. 156).** The large or cultivated variety of Bael-fruit or Bengal quince, *Eng.* Baṛe-qisam-ká-bél-phal, *Hind.* and *Duk.* Periya-vilva-phaz*h*am or Periya-vilva-paṛam, *Tam.* Pedda-bilva-pandu, Pedda-marédu-pandu, *Tel.* Valiya-kuvalappaṛam, *Malyal.* Doḍḍa-bilva-haṇṛu, *Can.* Mahá-bél, Baṛá-*sh*ri-phal,

Beng. Thóra-bélácha-phalá, *Mah.* Móṭu-bíli-nu-phal, *Guz.* Mahá-bélli, Lokka-bélli, *Cing.* Kígí-oushi-si, *Bur.* Shule-kaláṅ, Balá-ghúne-kláṅ, *Pers.* Safarjale-hindíé-kabír, *Arab.* Of the pulp (**Nos. 154 and 155**). The pulp of the large or cultivated variety of Bael-fruit or Bengal quince, *Eng.* Baṛe-qisam-ké-bél-phal-ká-magḥz, *Hind.* and *Duk.* Periya-vilva-pazham-sadai, or Peru-vilva-paṛam-sadai, *Tam.* Pedda-bilva-panḍu-kanḍa, Pedda-bilva-panḍu-guja, *Tel.* Magḥze-shule-kalán, Magḥze-balágḥúne-kalán, *Pers.* Magḥze-safarjale-hindíé-kabír, *Arab.*

Local Sources.—Not sold in the bazaar, but is generally procured in many gardens at Madras in the proper season.

Price.—From 1 to 3 rupees per 100, according to the size of the fruit.

Physiological Actions, Therapeutic Uses, Preparations, Doses and *Remarks.*—I have already described the large or cultivated variety of Bael-fruit, and said every thing I could say about it from my own knowledge and experience under the above headings in the preceding article (the small or common variety of the same fruit), and therefore refer the reader to it.

† Peganum Harmala, *Linn.* 157.

Habitat.—Pretty common in some parts of India, such as Kashmir, N.-W. Provinces, Scinde and the Punjab.

Parts Used.—The seeds.

Synonyms.—Hurmul or Hurmal, *Arab.* Isband or Ispand, *Pers.* Isband, *Hind.* Viláyatí-mhéṅdí-ké-bínj, Viláyatí-isband, *Duk.* Shí-mai-azhavanai-virai, *Tam.* Síma-gorinṭa-vittulu, *Tel.* Isband, *Beng.*

Local Sources.—The seeds are one of the commonest drugs in India, and found in almost every large bazaar.

Price.—Wholesale, Rs. 4 per maund; retail or bazaar, As. 3½ per pound.

Physiological Actions.—Narcotic, antispasmodic, hypnotic, anodyne, nauseant, emetic and emmanagogue.

Therapeutic Uses.—The seeds possess a good control over asthma, hiccough, hysteria, rheumatism, impaction of calculus in the ureter and of gallstone in the gall-ducts, colic, jaundice, dysmenorrhœa and neuralgia; and they relieve muscular pains and procure sleep effectually whenever those effects are desired. The relief afforded by this drug in simple cough and a few other pectoral affections is generally satisfactory. It is also a good nauseant and depressant emetic in its largest medicinal doses (℥iss to ℥ij); but it cannot be employed as such in general practice, because its use in so large a quantity is always accompanied by its narcotic and hypnotic actions.

Preparation.—Simple powder, prepared in the usual way and kept in a closed vessel.

Doses.—Of the powder, from thirty grains to two drachms increased gradually. The average dose is one drachm, which is sufficient in many ordinary cases.

European Drugs for which they may be substituted.—For belladonna, ether, morphia, salicylic acid and its salts, lactuca, conium, squills, lobelia and yellow jassamine (gelsemin).

Remarks.—The seeds are brown, irregularly triangular, about a line in length, odorless and bitterish in taste. Although these seeds are about six or seven times larger than those of *Lawsonia alba*, yet they bear a great resemblance to the latter in their outline; hence the meaning of the Tamil, Telugu and Dukhni synonyms—"the seeds of Europe or foreign *L. alba*." *Hurmul* is possessed with many good qualities, as already explained; but of all these, the antispasmodic, anodyne and nauseant properties of the drug is a happy combination, which makes it very useful in asthma, hiccough, rheumatism, impaction of gravel in ureter, &c. In asthma, hiccough and hysteria, it is, at least, equal to ether, if not superior to it; and in a fit of the gravel or impaction of a biliary calculus in the gall-ducts, the relief it affords is sometimes astonishingly great and rapid. Its influence over rheumatism is often more speedy and satisfactory than salicylate of soda. No Hospital should be, in my humble opinion, without a drug so cheap and with so many good qualities as *Hurmul*.

SIMARUBEÆ.

† Ailantus malabarica, *DC.* 158 and 159.

Habitat.—Malabar, Travancore, Coimbatore, Ceylon and Concan.

Parts Used.—The resinous exudation (**Nos. 158 and 159**), and bark.

Synonyms.—Of the resin—Ládan, *Duk.* Maḍḍi-pál, *Tam.* Maḍḍi-pálu, *Tel.* Maṭṭip-pál or Maṭṭi-pál, *Malyal.* Of the bark—Maḍḍi-pál-paṭṭai, *Tam.* Maḍḍí-pálu-paṭṭa, *Tel.* Maṭṭi-pál-paṭṭe, *Malyal.*

Local Sources.—The third or hard variety is plentiful in the local market, the second or flat, very seldom met with, and the first or soft, not procurable, except through the Forest Department.

Price.—Of the third or hard variety—Wholesale, Rs. 6 per maund; retail or bazaar, As. 6 per pound.

Physiological Actions.—The resin is terebinthinate-stimulant, its action being chiefly directed to the mucous surface of the genito-urinary organs and of the large and small intestines; and the bark is tonic and demulcent.

Therapeutic Uses.—The resin, particularly its first or soft variety, which I shall describe presently, possesses so great a control over acute dysentery and diarrhœa that I shall speak of its medical properties in a special manner under the head of *Remarks*. In gonorrhœa, gleet, chronic bronchitis and cystitis also it proves very useful and exercises a distinct beneficial influence. As a tonic, the bark resembles calumba and quassia, and like them it is administered with the preparations of iron, since it contains no tannin and is devoid of astringency.

Preparations.—Of the resin—Draught. The resin is divided, into small pieces and beaten with powdered gum in a mortar, and then gradually mixed with water until an emulsion is formed. Of the bark—Decoction. Take of the bark, in coarse powder, four ounces; water,

two pints; boil on a slow fire till the liquid is reduced to one pint, and strain when cool.

Doses.—Of the resin, from one to three drachms; and of the decoction, from two to four fluid ounces; three or four times in the twenty-four hours.

European Drugs for which they may be substituted.—The resin for copaiba, benzoin, geranin and ulmus; and the bark for calumba and quassia.

Remarks.—There are three varieties of the resin of *A. malabarica*, which, for the sake of convenience, may be called the first or soft, the second or flat, and the third or hard. The resin of the first variety is collected in bamboo-joints, one of which I have received from the Annamullay forests in the Coimbatore district, through the kindness of Messrs. H. J. A. Porter and G. Homfray of the Forest Department. This variety is never found in the bazaar of Madras or any other place, as far as my knowledge extends, but is occasionally supplied by special request to exhibitions and to medical men requiring to examine or use it, by the Forest Department of this Presidency. When new, the resin in this variety is grey, very soft, viscid, plastic, opaque, and bears a great resemblance in its appearance to the *birdlime* prepared from the milky juice of *Ficus glomerata*. It retains its grey color internally for a long time, but every part of it which comes in contact with the atmosphere becomes reddish-brown in a few hours and then deep-brown. The resin has an agreeable aromatic or balsamic odor, and though it is not soluble in saliva, it produces a terebinthinate taste in the mouth when chewed. The resin is neither soluble nor miscible in cold or hot water, it is, however, miscible with the aid of rubbing and grinding in alcohol, ether and many fixed and essential oils, as cocoanut, olive, turpentine, cajuput, anise, &c. After the lapse of some months, the resin, if exposed to the air, becomes much harder and feels as tough as wax; and after a few months more, it is as hard as a stick. The second or flat variety **(No. 158)** is extremely rare and occurs in flat and circular pieces, varying in diameter from two to three inches, and in thickness from $\frac{1}{4}$ to $\frac{1}{2}$ inch. The pieces are more or less soft like wax, rough, cracked, dark-brown in color, and similar to the resin in the first variety in all other characters.

The third or hard variety **(No. 159)**, which is by far the most common, occurs in small balls generally about the size of a small orange. The balls are very hard, smooth, dark-brown in color both externally and internally, and possess the same kind of smell and taste, but in a much slighter degree. It contains a great deal of impurities (about 80 per cent.), as earth, sand, fragments of wood, &c., upon which its hardness chiefly depends.

Through the kindness of the same gentlemen, whose names I have mentioned above, and to whom I feel very thankful, I have obtained a supply of the bark of *A. malabarica* from the same place, namely, the Annamullay forests. I owe my thanks also to Raisul Islam Sahib, the Hospital Assistant of the 2nd M.N.I., for another supply of it from the Quilon. The latter has also furnished me with some leaves of the plant from which he removed the bark, and they are correctly those of *A. malabarica*. The pieces of the bark from the Annamullay forests are about 1 foot long, from 4 to 6 inches broad, and from $\frac{3}{4}$ to 1 inch

thick. The bark is of a grey or deep-grey color internally, slightly demulcent and bitterish in taste, and is covered externally with a thin epidermis, which is greenish-brown and not scaly, but rough from numerous and small granular elevations. The bark is studded with "garnet-looking grains" of a reddish-yellow color and "apparently of a resinous nature." The grains can be easily separated from other parts of the bark by reducing the latter to a coarse powder and passing it through muslin. Most of the grains remain on the cloth and are very easily separated by winnowing or by the fingers. The weight of the grains is more than all other parts of the bark if it is from a young plant, but somewhat less if it is the produce of an old tree. With the exception of the color, they bear the greatest resemblance to the rolong of wheat in their outline and appearance, but are generally twice the size, particularly if they are from the bark of a young plant. When the bark is fresh, the grains are much paler or almost white in their color, and also much larger and more or less round.

The bark from Quilon is in small and irregular pieces, varying in length and breadth from 3 to 5 and 2 to 3 inches, respectively, and in thickness from 2 to 5 lines. In all other characters it is quite identical with the bark from the Annamullay forests. Judging from the thickness of the bark from the latter place, which is fully one inch thick, it must have been from a very large and old tree, and that from the former locality (Quilon), which is only five lines in thickness, from a comparatively very young and small plant. I have not, however, found any distinct difference between the medical properties of the barks.

With regard to the therapeutic uses of the resin of *A. malabarica*, its first variety, if fresh, has a very remarkable control over dysentery and diarrhœa as though it possesses some specific action over the mucous coat of the large and small intestines, and therefore deserves some special attention of the profession. In some ordinary cases of acute dysentery and diarrhœa two or three doses of the resin in the form of emulsion with the mucilage of gum acacia, and with from 5 to 10 minims of *Tinctura opii* in each dose were sufficient to nip the diseases in the bud. There were no more motions, tormina or tenesmus after the second or third dose for 10 or 12 hours, and when the bowels did begin to move again after this period, the evacuations were always healthier and soon became natural without further treatment. In more severe cases, however, the medicine had to be repeated three or four times in the 24 hours and continued for two or three days before the cure was effected. In still more severe or serious and complicated cases, it was necessary to resort to some other medicines, including astringent enemata, &c., to assist the resin according to the condition and symptoms of each individual case. *Maṭṭi-pál* is also useful in gonorrhœa and gleet, and to the same extent as the Copaiba and Gurjun-balsam.*

Some native practitioners speak highly of the bark of *A. malabarica* as a remedy in dysentery, but I have lately tried it in several cases and

* I have omitted in this article several details concerning the preparation and administration of the resin containing, as the author says, about 80 per cent. of impurities. The results of experimenting with such an impure article are consequently valueless. The resin is very little used internally.—D. H.

did not even in a single instance observe any distinctly good effect. It is, however, a good bitter tonic, contains no tannin, and is therefore a very good substitute for calumba and quassia. Several other thick barks are erroneously sold in the bazaar under the same native names, but none should be considered genuine unless it is found to contain the *resinous grains* I have described. Moreover, the true bark of *A. malabarica* does not respond to the iron-test for tannic acid.

† Ailantus excelsa, *Roxb.* 160.

Habitat.—Pretty common in Northern Circars, Coimbatore and North-Western Provinces. There are two plants in the Agri-Horticultural Society's Gardens, but nowhere else in the whole city of Madras.

Part Used.—The bark of the stem and root.

Synonyms.—Of the bark—Peru-marattup-paṭṭai, *Tam.* Valiya-marattóli, Peru-marat-tóli, *Malyal.* Kumba-la-putta, *Cing.* Of the root-bark—Peru-maram-vérpaṭṭai, *Tam.* Peru-maram-véra-tóli, *Malyal.*

Local Sources.—Several kinds of thick barks are always sold in the bazaars of Madras under the above native synonyms, but the real bark of *A. excelsa* is extremely rare.

Price.—Of the bark—Wholesale, Rs. 3 per maund; retail or bazaar, As. 2 per pound.

Physiological Actions.—Febrifuge and tonic.

Therapeutic Uses.—Useful in some mild cases of simple continued fevers, and of dyspepsia.

Preparations.—Of the stem bark—Simple-powder, decoction and infusion. The simple powder is prepared in the ordinary way. Decoction: Take of the bark, in coarse powder, four ounces; water, two pints; boil on a slow fire till the liquid is reduced to one pint, and strain when cool. Infusion: Take of the bark, in coarse powder, four ounces; boiling water, two pints or just sufficient to cover the powder ounces; infuse in a covered vessel for two hours and strain. Of the root-bark—Simple powder, decoction and infusion. The powder, decoction and infusion of the root-bark are prepared in precisely the same manner as the corresponding preparations of the stem bark.

Doses.—Of the powder, from one to two drachms; and of the decoction or infusion, from one and-a-half to three fluid ounces; three or four times in the twenty-four hours. The doses of the corresponding preparations of both the bark and root-bark are the same.

European Drugs for which they may be substituted.—Gentian, Calumba, Quassia and Pulv. Antimonialis.

Remarks.—There is a great deal of confusion about the bark of *A. excelsa* in the bazaar as well as in books. In the former, it is almost always substituted by several other barks, and its description in the latter is so different from its real characters that it is undoubtedly confounded with the bark of some other plant or plants. The statement that the bark is "aromatic" and "pleasant" is very erroneous, and is one of the chief causes of the above confusion, because the real drug is quite free from such characters. As there are two large trees of *A. excelsa* in the Agri-Horticultural Society's Gardens at Madras, as

already mentioned, I have repeatedly examined their bark and root-bark and found them to be as follows :—

The bark of the trunk is very rough and scaly, varying in thickness from 3 to 7 lines; grey internally; bitterish in taste; quite odorless when dry, but possesses a rather unpleasant smell when fresh. The bark of the smaller branches are only rough but not scaly, less bitter in taste, and quite devoid of smell like the bark of the trunk when dry. The external color of the bark of *A. excelsa* differs much in one and the same plant. For the most part the color is deep-grey or greyish-brown; but in some parts it is either pale-white, greenish-brown or even black or dark-brown. The white-ants are very fond of this bark, and the trunk of the tree is, therefore, up to some feet from the ground often covered with them. The bark which is thus attacked by them is always of a pale-white color. The greenish-brown color is confined to small branches, while a small portion here and there, which apparently retains the moisture for a longer period in the rainy season, is quite black or dark-brown in color. The contrast between the black and other colors of the bark is so great that there will be a great difficulty in its identification unless a person is acquainted with the above circumstances.

The root-bark of *A. excelsa* is much smaller and thinner, rough, invariably quilled, of a deep-grey color both externally and internally, odorless and more bitter in taste than the bark of all other parts of the plant. The bitter principle is perhaps due to ailantic acid which has been separated from the bark by Dr. N. Daji.

The bark is certainly a good tonic, but not in so weak a preparation and so small a dose in which some native practitioners are said to prescribe it, namely, ʒvi in a day of an infusion prepared by infusing only ℥iij of the drug in Oi of warm water. I have employed the bark pretty frequently in my practice during the last year and never found it to produce any distinctly good effect until the infusion was made about 8 times (ʒiij to Oi) stronger than the one just mentioned. Of all the preparations of the bark, however, the decoction already described in its proper place, is the most efficacious and satisfactory. Both the decoction and infusion, particularly those prepared from the bark of smaller branches, are blackened by the persalts of iron, indicating the presence of astringent matter. The bark of *A. excelsa*, therefore, although resembling Calumba and Quassia a great deal in its actions, is not so good a substitute for them as the bark of a *A. malabarica*.

As a drug, the root-bark of *A. excelsa* is superior to its stem bark; with this exception every remark I have made in reference to the medical properties and preparations of the latter, is quite applicable to the former.

‡ Balanites Roxburghii, *Planch.* (B. Ægyptiaca, *Delile.*) 161.

Habitat.—Common in Bellary, Saugor and in the Dooab and Deccan.

Part Used.—The kernel of the nut.

Synonyms.—Of the kernel—Hingan-ká-ma*ghz*, *Hind.* Hígan-ká-ma*ghz*, *Duk.* Nanjundan-sadai, *Tam.* Gára-pandu-kanda, Gára-pandu-goju, *Tel.* Of the fruit—Hingan, *Hind.* Hígan, *Duk.* Nan-

jundán-pazham, *Tam.* Gára-pandu, *Tel.* Nanchunṭa-paṛam, *Malyal.* Hingon-phal, *Beng.* Ingudi-phalam, *Sans.* Hingaṇa-cha-phal, *Mah.* Hingernu-phalá, *Guz.*

Local Sources.—Not met with in Madras, but is sent for from Bellary or Adoni whenever it is required.

Physiological Actions, Therapeutic Uses, Preparations and *European Drugs for which it may be substituted.*—Quite similar to those of the fruits of *Anamirta cocculus.**

BURSERACEÆ.

† **Balsamodendron Mukul**, *Hook.* **162. 163.**

† **Balsamodendron pubescens**, *Stock.* **164.**

‡ **Balsamodendron Roxburghii**, *Arn.* **165.**

Habitat.—Scinde, Silhet, Assam, Kattiawar, &c.

Part Used.—The gum-resin.

Synonyms.—Bdellium, *Eng.*, *Fr.* and *Ger.* Gógil, *Hind.* Gúgal, *Duk.* Maishákshi or Maishách, Gukkulu, *Tam.* Mahi sákshi or Mai-sákshi, *Tel.* Guggala, *Can.* Gúgul, *Beng.* Konṣhikaha, *Sans.* Guggula, *Mah.* Gugul, *Guz.* Gugula, Jaṭayu, or Javáyu, Raṭa-dummula, *Cing.* Moql, Moqle-arzaq, Aflāṭan, *Arab.* Bóe-jahúdáṅ, *Pers.*

Local Sources.—Met with in all the large bazaars of India.

Price.—Wholesale, Rs. 4 per maund; retail or bazaar, As. 3 per pound.

Physiological Actions.—Stimulant to both the skin and mucous membrane, antispasmodic and emmenagogue.

Therapeutic Uses.—As a local remedy *Bdellium* is very useful some spasmodic affections, as *hiccough*, and also in some nervous and rheumatic complaints. Although it exercises a distinctly beneficial influence over amenorrhœa and gonorrbœa, its administration internally is attended with the greatest inconvenience. Its doses are too large to be used in pills or bolusses, and it cannot be reduced to powder in consequence of its moisture and gumminess. Emulsion is the only form in which it can be employed, but its taste is so bitter and disagreeable that few patients will agree to its use.

Preparations.—Emulsion and plaster —Bruised with water, *Bdellium* which is a gum-resin, forms a thick and white emulsion without mucilage, and as it always contains more or less impurities, the draught should be strained through muslin before use. The plaster is prepared by bruising well the drug in a stone mortar with hot water, and as soon as it is applied to any part of the body it should, if possible, be dried by means of fire. When dry, the adhesion between the soft resin and the skin is so great that it cannot be easily removed.

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* This statement requires confirmation. The pericarp of the fruit, the bark and the root contain saponin, and are used as purgatives, anthelmintics and expectorants. The kernels of the seeds yield a light yellow and tasteless fixed oil, which is the *Zachun oil* of Africa.—D. H.

Dose.—From thirty grains to two drachms.

European Drugs for which it may be substituted.—Myrrh, ether, and the mustard flour imported from Europe.

Remarks.--The gum-resin occurs in small pieces or masses of various forms (irregular, angular, flat, roundish, &c.) and varies in size from a pea to a small walnut. It is originally of a yellowish or reddish brown color and translucent, but being more or less moist and gummy to the touch, it becomes generally covered with dirt and assumes a dirty brown color. It possesses a very bitter and terebinthinate taste and a faint and peculiar balsamic odor.

As a local remedy in certain maladies, *Bdellium* deserves more than a casual notice. The Hakeems often apply it to the sternum in *hiccough*, and sometimes with success to my own knowledge. About two years ago a very severe and obstinate case of the above disease occurred in my own practice, which defied the action of all the European remedies generally in use, including ether, chloroform, mustard, &c., for three days, but yielded to the paste of this drug like a charm. In this case I not only applied the paste (prepared as directed under the heading of *Preparations*) to the sternum as far as the ensiform cartilage, but also along the costal margin on both sides to the extent of 4 or 5 inches. As the inner surface of the above bony parts gives attachment to the greater muscle of the *diaphragm*, the paste seems to have acted upon the latter as an antispasmodic and relieved its spasms so readily and efficiently as just mentioned. Although the *hiccough* did not return, the paste was applied twice more at the intervals of six hours on the following day as a precautionary measure.

The plaster is also useful in some cases of nervous and rheumatic pains, as already noticed, but to a less extent, and generally requires to be repeated three or four times before the desired effect is produced.

* Balsamodendron Myrrha, *Nees.* 166.

Habitat.—Arabia.

Part Used.—The gum-resin.

Synonyms.—Myrrh, *Eng.* Myrrhe, *Fr.* Myrrha, *Gr.* Ból, *Hind.* and *Duk* Pólam, Vellaip-pólam, *Tam.* Pólam, Balintra-pólam, *Tel.* Bóla, *Can.* Ból, Híra-ból, *Beng.* Gan*dh*a-rasa*h*a, Rasa-gan*dh*a*h*a, *Sans.* Bálata-bóla, *Mah.* Ból, *Guz.* Ganda-rassa, Bólam, *Cing.*

Local Sources.—Procurable in every large bazaar of India.

Price.—Wholesale, Rs. 1½ per maund ; retail or bazaar, Anna 1 per pound.

Physiological Actions, Therapeutic Uses, Preparations and *Doses.*—I have nothing to say under these heads from my own knowledge and experience, and therefore refer the reader to the *Pharmacopœia of India*, page 51. The drug is also described well in the *Pharmacographia* and the *Parmacographia Indica.*

† Balsamodendron Opobalsamum, *Kunth.* 167 and 168.

Habitat.—Arabia.

Part Used.—The balsamic exudation.

Synonyms.—Balsam of Mecca or Balm of Gilead, *Eng.* Duhnul-balsáṅ, Balsáṅ, *Arab.* Róġhane-balsan, Balsáṅ, *Pers.* Balsáṅ, Balsáṅ-ká-tél, *Hind.* and *Duk.*

Local Sources.—Not generally sold in the bazaar. Many of the pilgrims of Mecca bring this balsam every year with them on their return to India, and sell it at a high price, generally about a rupee or a rupee and a half per pollum.

Physiological Actions.—It is stimulant to the skin and to the mucous-membrane of the genito-urinary organs. It is also a stimulant diuretic.

Therapeutic Uses.—In gonorrhœa, gleet and chronic cystitis, it is quite as efficacious as copaiba.

Preparations.—It being less disagreeable in taste and odor than copaiba, it can be easily taken floating on water or milk; but on account of its thickness it is best used in emulsion with mucilage, or, in the form of a mixture with Spirit. Æther. Nit., Liq. Potass., and some other suitable medicines, in addition to the mucilage.

Doses.—From thirty minims to two fluid drachms, three or four times in the twenty-four hours.

European Drugs for which it may be substituted.—Copaiba.

Remarks.—There are generally three varieties of the balsam of Mecca, distinguished according to their color and consistency as a superior, a middling and an inferior variety. The superior variety is a thick, viscid and translucent liquid of a brownish red color, with a peculiar but very agreeable aromatic smell, and a bitterish and terebinthinate taste. It remains in its liquid state for years without throwing down any deposit at the bottom of the vessel. This is the best variety of the Balsam of Mecca or Balm of Gilead procurable in Arabia, and is only found in the valley known as Vádí-Halfá, which is about midway between Mecca and Medina. The middling (**No. 167**) occurs in the form of a pale-yellow or dull-white, semi-fluid oleo-resin, with a peculiar agreeable odor and a bitter and terebinthinate taste. In the hot season, the oily portion of the drug melts, gets thinner and floats on the upper surface, while the resinous matter remains at the bottom of the vessel. The inferior variety (**No. 168**) is still thicker in consistence, darker in color (pale-brown or brown) and contains less oily matter than the middling variety, which it resembles most in its odor and taste. The difference in the physical characters of this balsam is due to the fact that fresh specimens contain a larger proportion of the essential oil than older samples which have been exposed to the air. The fresher variety is also much more efficacious medicinally than the darker and thicker balsam.

† Canarium strictum, *Roxb.* 169.

Habitat.—Travancore and Canara.

Part Used.—The resin.

Synonyms.—Black dammar, *Eng.* Kálá-ḍámar, *Hind.* and *Duk.* Karuppu-ḍámar, *Tam.* Nalla-rójan, *Tel.* Kálá-ḍámar, *Beng.* Kálo-ḍámar, *Guz.* and *Mah.*

Local Sources.—Common in all the large bazaars of Southern India.

Price.—Wholesale, Rs. 2 per maund; retail or bazaar, As. 1½ per pound.

Physiological Actions.—Stimulant and rubefacient; not employed internally.

Therapeutic Uses.—Applied in the form of plaster over the chest or loins, it is said to act like Emp. Picis and relieve chronic cough and lumbago, respectively.

Preparations.—Plaster. The following formula, which is much cheaper than the one used in preparing the plaster of *Burgundy Pitch* (*Emplastrum Picis*), is recommended by Dr. G. Bidie, M.B. & C.I.E.:—

"Take of black dammar, lb. ij; olibanum, lb. j; piney resin and bees' wax, of each ℥ iv; roussa oil (*Andropogon Schœnanthus*) ℥ j; ground-nut or gingelly oil, and water, of each ℥ ij; add first the olibanum, then the roussa oil, the ground-nut oil and the water to the black dammar, piney resin and wax melted together. Lastly, mix the whole and boil down to proper consistence." (*Madras Quart. Journ. of Medl. Science, No. X, Oct.* 1882, *p.* 292.)

European Drugs for which it may be substituted.—Burgundy Pitch.

Remarks.—The following is a good and graphic description of black dammar by Dr. G. Bidie:—

"It occurs in stalactitic masses of a bright shining black color when viewed at a distance, but translucent and of a deep reddish brown color when held between the eye and the light. It is homogeneous, has a vitreous fracture, is partially soluble in boiling alcohol, and completely so in oil of turpentine. It has in burning a more resinous smell and denser smoke than the other dammars."

I have not yet used this resin myself, but from its sensible properties there is no doubt that it is a pretty good substitute for Burgundy Pitch as suggested by Dr. Bidie.

* **Boswellia floribunda**, *Endle.* **170.**

‡ **Boswellia glabra**, *Roxb.* **171.**

‡ **Boswellia serrata**, *Roxb.* (**B. thurifera**, *Roxb.*). **172.**

Habitat.—*B. floribunda*: the Somali Coast, East Africa. *B. serrata* and its variety *glabra.* Central India, Coromandel Mountains, Deccan, and some other parts of India.

Part Used.—The gum-resin.

Synonyms.—Indian olibanum, Indian frankincense, *Eng.* Kundur, Sél-gónd, Gandah-barózah, *Hind.* Kundur, Farangi-âúd, Gandah-férózah, *Duk.* Paṛaṇgi-*sh*ámbiṛáṇi, Kundurukam-pi*sh*iṅ, *Tam.* Parangi-sámbráṇi, Anduga-pisunu, *Tel.* Vella-kundirukkam, Vaḷanku*ch*-ámbráṇi, Manṇa-kungiliyam, *Malyal.* Kundro, Salai, Sailai-gun, *Beng.* Salasi-niryásam, *Sans.* Kundrikam, *Cing.* Barangi-lobán, *Bur.* Bastaj, Kundur, Lubán, *Arab.* Kundur, *Pers.*

Local Sources.—It is one of the drugs always found in all the large bazaars of India.

Price.—Wholesale, Rs. 3 per maund; retail or bazaar, As. 2 per pound.

Physiological Actions.—Internal and external stimulant, expectorant, stimulant-diuretic and stomachic. It is also a slight hepatic stimulant.

Therapeutic Uses.—Useful in jaundice not depending on mechanical obstruction and in some slight and chronic cases of diarrhœa, dysentery, dyspepsia, pulmonary affections and hæmorrhoids. In the form of an oily solution, it exercises some good influence over the growth of the hair; and in that of an ointment, it excites a healthy action in some weak and unhealthy kinds of ulceration.

Preparations.—Powder, oily solution and ointment. The powder is prepared in the usual way and kept in a stoppered bottle. Best used with sugar and water. Oily solution: Take of the resin, in powder, two ounces; jinjily or gingelly oil, six fluid ounces; mix and rub well in a mortar; heat the oil on a slow fire for 15 minutes, stirring it frequently, and strain the same while hot through cloth. It should be rubbed well to the roots of the hair once or twice a day for some weeks, the bottle being well shaken before use on each occasion. Ointment: "Take of Olibanum, Sesamum or Poppy oil, and white wax, of each an ounce. Melt together with a gentle heat and strain" (*Pharm. of India*, p. 53).

Dose.—Of the powder, from one to two drachms, three or four times in the twenty-four hours.

European Drugs for which it may be substituted..—Benzoate of soda, Gummi-Rubrum, Gum-Ammoniacum and Abietis Resina.

Remarks.—When *Olibanum* or *Indian frankincense* occurs in small tears it is recognized as *Kundur* in the local market, and when it is found in soft and irregular masses (as it does sometimes when it is new) it is called *Gandah-férózah*. The latter is, however, properly the name of some varieties of turpentine.

There are two distinct varieties of *Olibanum* in the bazaars of Madras, in one of which the tears of the drug are proportionately very large, and in the other very small. In the large variety, which is more readily recognised under the Tamil synonym "*Paṛangi-Ṣhámbiráni*" in South India, the tears are either separate and distinct, or agglutinated together and form large and irregular masses. When separate, the tears are generally oval, oblong or roundish; reddish-yellow, reddish-brown, pale-white, yellowish-white or deep-grey in color; and vary in their dimension in the thickest part from three lines to one inch. They are translucent, possess a slight balsamic and agreeable odor, and also a slight balsamic and somewhat pungent taste. When chewed in the mouth, they do not dissolve, but become soft, elastic, white and opaque, imparting at the same time some whiteness to the saliva. When two or three tears agglutinate together, they still retain all the above characters, except the irregularity and largeness of the size, which are the necessary results of the agglutination. But, if the agglutination involves more than three or four tears, the resulting mass is extremely irregular, greyish or yellowish brown, rough, and generally contains much impurities, as fragments of bark, fibres, &c. These masses when new and very soft, are considered erroneously to be a variety of *Gandah-férózah*, as already remarked.

When the tears or masses of *Olibanum* are placed in water, they become white like chalk or lime in a few minutes, and this is an important character, by which alone they can be readily distinguished from all other gum-resins and gums to which they bear a great resemblance. The only drug which also possesses this character, as far as my own knowledge and experiments extend, is *Ammoniacum;* but the difference between all other physical properties of the latter and those of *Olibanum* is so great that they will not be easily confounded with each other.

The small variety of *Olibanum* or *Kundur* consists of very small grain-like tears of various shapes—round, oblong, flat, circular and irregular. The round tears are generally about the size of green-gram, and the oblong ones seldom exceed two lines in their length. They are almost always of a pale-yellow or yellowish-white color. In all other respects the small variety is quite identical with the large one.

The difference between the size of the two varieties being extremely great, I thought at one time that the small variety was merely the broken fragments of the larger masses rounded by attrition, but this is not the case. I have examined some bags and jars in which the large variety of *Olibanum* is generally kept for sale in the bazaar, and found the small broken pieces at the bottom to be quite different from the tears of the small variety.

From its small size and yellowness the small variety of *Kundur* is often confounded with *Mastich*, but it can be easily and readily distinguished from the latter if a few pieces or tears of both are put in water. *Kundur* turns white like chalk in ten or twelve minutes, as already explained, but *Mastich*, a true resin, is unaltered, however long it may be kept in water. It will be observed from the above explanation that water has the same effect on both the large and small varieties of *Kundur*, but its action is much more rapid on the former than on the latter.

The Arabic and Persian medical works generally speak of five varieties of *Kundur* or *Olibanum*, which are as follows :—

If the tears are circular and of a reddish yellow or reddish-brown color, they are called *Kundur Zakar* (male kundur); if pale yellow or pale-white, *Kundur-unṣá* (female kundur); if round or spherical, *Kundur-mudaḥraj* (round kundur); if very thin and scaly as though separated by bruising from the bark or scurf of the plant, *Qishár-Kundur;* and if in coarse powder or dust (debris consisting of minute particles of all forms), *Daqáq-Kundur*.

As the size of the tears is not mentioned in any of the above medical works, as far as my knowledge extends, it is rather difficult to say positively whether the varieties described in them are referable to the tears of the large or the small variety of *Olibanum* or *Indian frankincense*. I think, however, they are referable to the tears of the latter, which alone is generally selected for medicinal purposes by the Hakeems at Madras.

The small variety of *Kundur* is an important article and decidedly preferable as a drug to the large one. Besides, it is about 4 or 5 times cheaper than the latter, and can be easily and conveniently administered in powder and draught, being both miscible in water and reducible to powder. It is, however, generally adulterated or mixed with a great deal of impurities, as gravel of different colors, sand, &c., which should be removed carefully before the drug is used.

Kundur is one of the few drugs which are recommended for more than 30 or 35 complaints in some native medical works, particularly those in the Persian language. I have been employing it occasionally for some time and still continue its use in my practice, but find it distinctly useful only in 7 or 8 diseases which I have mentioned under the heading of "*Therapeutic Uses*" in the present article.

MELIACEÆ.

† Melia Azedarach, *Linn.* 173 and 174.

Habitat.—Persia, China—Pretty common in South India.

Parts Used.—The root-bark and seeds.

Synonyms.—Of the root-bark—The root of the Persian Lilac or Bead tree, *Eng.* Bakáyan-kí-jaṛ-kí-*chh*ál, Mahá-nínb-kí-jaṛ-kí-*chh*ál, *Hind.* Górí-ním-kí-jaṛ-kí-*chh*ál, Goulí-nim-kí-jaṛ-kí-*chh*ál, *Duk.* Malai-vém-bu-vér-paṭṭai, Malai-véppam-vér-paṭṭai, *Tam.* Konḍa-vépa-véru-paṭṭa, Turaka-vépa-véru-paṭṭa, *Tel.* Beṭṭadá-bévina-béru-paṭṭe, *Can.* Mahá-ním-jar-chhál, *Beng.* Parvata-nimba-múl-valka-lam, *Sans.* Maha-nimba-múl-potta, *Cing.* Póste-bí*kh*e-ázád-dara*kh*t, *Pers.* Of the seeds—The seeds of the Persian Lilac or Bead tree, *Eng.* Bakáyan-ke-bínj, Mahá-nínbké-bínj, *Hind.* Górí-ním-ké-bínj, Goulí-nim-ké-bínj, *Duk.* Malai-vémbu-virai, Malai-veppam-virai, *Tam.* Konḍa-vépa-vittu, Turaka-vépa-vittu, *Tel.* Beṭṭada-bévina-bíja, *Can.* Mahá-ním-bíchi, *Beng.* Parvata-nimba-bíjam, *Sans.* Mahá-nimbá-aṭṭa, *Cing.* Tu*kh*me-ázád-dara*kh*t, *Pers.*

Local Sources.—Neither the root-bark nor the seeds are sold in the bazaar, but require to be gathered.

Physiological Actions.—Tonic and anthelmintic.

Therapeutic Uses.—Useful in some of those cases in which chiretta is indicated, and round-worms are sometimes expelled under its use.

Preparations.—Of the root-bark—Powder and decoction. The simple powder of the root-bark is prepared in the usual way and passed through a sieve or cloth. Decoction: Take "four ounces of the fresh root-bark, water two pints, boil to one pint" (*Pharm. of India*, p. 55). Of the seeds—Powder, which is prepared in the same manner as that of the root-bark.

Doses.—Of the powder of the root-bark, from forty to eighty grains; of the decoction of the root-bark, from four fluid drachms to a fluid ounce, in children from 5 to 12 years old, up to 5 or 6 doses in the 24 hours; and of the powder of the seeds, from one to two drachms.

European Drugs for which they may be substituted.—Gentian and calumba.

Remarks.—The root-bark is very thin and light, rough and dark-brown externally, pale-white internally, and bitterish in taste. The seeds are generally about the size and shape of thick and long grains of rice, but dark-brown and shining; kernel albuminous, pale or yellowish white, and slightly bitterish and oily in taste. The nut or shell

of the berries in which the seeds are contained is oval, hard, rough and five-celled with one seed in each cell.

The root-bark is so thin and light that I had to destroy three plants and dig out the whole of their roots to get eight ounces of it. A decoction was prepared and used in five children according to the directions in the *Pharm. of India*, p. 55. Out of these children only one passed a round worm, and the rest remained unaffected. A few days afterwards, however, the same children passed out from nine to twenty-three *Ascaris lumbricoides* under the use of *Santonin*. Under these circumstances, if the root-bark of *M. Azedarach* is vermifuge at all, it is a very weak one.

Although the berries of this plant are pretty abundant in their proper season, yet each of them contains only five small seeds, as mentioned above, and it is, therefore, rather difficult to collect the latter in a large quantity for use.

* Melia Azadirachta, *Linn.* (Azadirachta indica, *Juss.* Melia indica, *Brandis.*) 175, 176, 177, 178, 179 and 180.

Habitat.—One of the commonest trees in India; often cultivated in houses and gardens, and planted in avenues in some places.

Parts Used.—Every part of this plant, except the wood, is used in medicine, namely, the bark (**No. 175**), root-bark, young fruit, nuts or seeds (**No. 176**), oil (**No. 177**), flowers (**No. 178**), leaves (**No. 179**), gum (**No. 180**) and toddy.

Synonyms.—Of the bark—The Ním or Margosa bark, *Eng.* Nímb-kí-*chh*ál, *Hind.* Ním-kí-*chh*ál, *Duk.* Vémbu-paṭṭai, Véppam-paṭṭai, *Tam.* Vépa-paṭṭa, Vépa-cheṭṭu-paṭṭa, *Tel.* Véppa-tóli, Ariya-véppa-tóli, *Malyal.* Bévina-mara-peṭṭe, *Can.* Ním-sál, *Beng.* Nímba-valkalam, *Sans.* Limba-cha-paṭṭa, *Mah.* Limba-nu-*ch*ál, *Guz.* Kohumba-potta, Nimbu-gaha-potta, *Cing.* Tama-biṇ-akháv, *Burm.* Póste-azád-dara*kh*te-hindí, Póste-níb, *Pers.* Of the root-bark—The Ním or Margosa root-bark, *Eng.* Nímb-kí-jaṛ-kí-*chh*ál, *Hind.* Ním-kí-jaṛ-kí-*chh*ál, *Duk.* Vémbu-vér-paṭṭai, Véppam-vér-paṭṭai, *Tam.* Vépa-véru-paṭṭa, *Tel.* Véppa-múḷam-tóli, *Malyal.* Bévina-béru-paṭṭe, *Can.* Nímba-múlam-valkalam, *Sans.* Ním-*sh*ikar-sál, *Beng.* Limba-cha-múḷi-paṭṭa, *Mah.* Limba-nu-jaḍ-chál, *Guz.* Kohumba-múl-potta, Nimba-múl-potta, *Cing.* Tama-mi-akháv, *Bur.* Póste-bí*kh*e-níb, Póste-ázád-dara-*kh*te-hindí, *Pers.* Of the fruit—The Ním or Margosa fruit, *Eng.* Nínb or Nímb-ká-*ph*al, *Hind.* Ním-ké-nínbólíyáṅ, *Duk.* Véppam-paṛam, Vémbu-pazham, *Tam.* Vépa-panḍu, Vépa-cheṭṭu-panḍu, *Tel.* Véppa-káya, Ariya-véppa-káya, *Malyal.* Bévina-mara-haṇṇu, *Can.* Ním-cha-panḍu, *Mah.* Ním-phal, *Beng.* Nimba-phalam, *Sans.* Limbanu-phal, *Guz.* Nimba-gaḍi, Kohumba-ká, *Cing.* Tama-aṣi, *Bur.* Barre-níb, Barre-ázád-dara*kh*te-hindí, *Pers.* Of the nut—The Ním or Margosa nut, *Eng.* Nímb-kí-gu*th*lí-yáṅ, *Hind.* Ním-ké-guṭlíyáṇ, *Duk.* Vémbu-koṭṭai, Véppam-koṭṭai, *Tam.* Vépa-koṭṭai, *Tel.* Véppa-kuru Ariya-véppa-anṭi, *Malyal.* Bévina-goṭṭi, *Can.* Ním-góṭli, *Beng.* Límba-cha-anthóli, *Mah.* Limba-nu-góṭli. *Guz.* Kohumba-aṭṭa, Nimba-koṭṭa, *Cing.* Tamabin-zi, *Bur.* Ta*khme*-ázád-dara*kh*te-hindí,

Tu*kh*me-níb, *Pers.* Of the oil—Ním or Margosa oil, *Eng.* Nímb-ká-tél, Nímb-ká-tél, *Hind.* Ním-ká-tél, *Duk.* Vémbu-eṇṇey, Véppam-eṇṇey, *Tam.* Vépa-núne, *Tel.* Véppa-eṇṇa, Ariya-véppu-eṇṇa, *Malyal.* Bévana-yaṇṇe, Bévana-mara-yaṇṇe, *Can.* Ním-tail, *Beng.* Limba-cha-téla. *Mah.* Nímba-tailam, *Sans.* Limba-nu-tél, *Guz.* Kohumba-tél, Nímba-tel, *Cing.* Tama-ṣí, Tama-bíṇ-ṣi, *Bur.* Róg*h*ane-níb, *Pers.* Of the flowers—The Ním or Margosa flowers, *Eng.* Nímb-ké-phúl, Ním-ké-phúl, *Hind.* Ním-ké-phúl, *Duk.* Vémbu-pú, Véppam-pú, *Tam.* Vépa-puvvu, *Tel.* Vappapú, Ariya-véppa-pú, *Malyal.* Bévina-huvvu, Bévina-mara-huvvu, *Can.* Ním-phúl, *Beng.* Nímba-pu*sh*pam, *Sans.* Limba-cha-phúla, *Mah.* Limba-nu-phúlá, *Guz.* Kohumba-mal, Nimba-mal, *Cing.* Tama-póén, *Bur.* Gule-ázád-dara*kh*te-hindí, Gule-níb, *Pers.* Of the leaves—The Ním or Margosa leaves, *Eng.* Nímb-ká-pát, Ním-ká-pát, *Hind.* Ním-ké-patté, *Duk.* Vémbu-ilai, Véppam-ilai, *Tam.* Vépa-áku, *Tel.* Veppa-ela, Ariya-véppa-ela, *Malyal.* Bévina-yale, Bévina-mara-yale, *Can.* Ním-pátá, *Beng.* Nímba-patram, *Sans.* Limba-cha-pána, *Mah.* Limba-nu-pándru, *Guz.* Kohumba-kola, Nimba-kola, *Cing.* Tamayo-e, *Bur.* Barge-ázád-dara*kh*te-hindí, Barge-níb, *Pers.* Of the gum—The Ním or Margosa gum, *Eng.* Nínb-kí-gónd, Nímb-kí-gónd, *Hind.* Ním-ká-gónd, *Duk.* Vémbu-pi*sh*in, Véppam-pi*sh*in, *Tam.* Vépa-pisunu, *Tel.* Veppa-pa*sh*a, Ariya-véppa-pa*sh*a, *Malyal.* Bévina-góndu, Bévina-mara-góndu, *Can.* Nim-lásá, *Beng.* Nímba-niryásam, *Sans.* Limba-cha-gónda, *Mah.* Limba-nu-gúndar, *Guz.* Kohumba-melliyam, Nimba-melliyam, *Cing.* Tama-sí, Tama-biṇ-si, *Bur.* Ṣama*gh*e-níb, Ṣama*gh*e-ázád-dara*kh*te-hindí, *Pers.* Of the toddy—The Ním or Margosa toddy, *Eng.* Nímb-ká-nírá, Nímb-ká-nírá, *Hind.* Ním-ká-nírá, *Duk.* Véppam-kaḷḷu, *Tam.* Vepa-kallu, *Tel.*

Local Sources.—The oil and dry nuts are sold in the local market, and all other parts require to be gathered.

Price.—Of the oil—Wholesale, Rs. 6 per maund; retail or bazaar, As. 10 per bottle. Of the dry nuts—Wholesale, Rs. 3 per maund; retail or bazaar, As. 2 per pound.

Physiological Actions.—The physiological actions of all the parts of this plant employed as drugs may be arranged as follows:—

The root-bark, bark and young fruit—tonic and antiperiodic.
The oil, nuts, and leaves—local stimulant, insecticide, and antiseptic.
The flowers—stimulant-tonic and stomachic.
The gum—demulcent-tonic.
The toddy—refrigerant, nutrient and alterative tonic.

Therapeutic Uses.—The bark, root-bark, and young fruit are useful in some slight cases of intermittent fever and general debility. The root-bark is more active and speedy in its action than the bark and young fruit. The margosa oil has proved itself a useful local remedy in some chronic forms of skin diseases and ulcers, by stimulating and exciting a healthy action. Applied to foul and sloughing ulcers, it retards the sloughing process to some extent, prevents the productions of maggots, and dislodges them if already produced. The oil is also a very useful adjunct to some other and stronger remedies, as chaulmugra oil, as already mentioned in my remarks under the latter drug. The dry nuts of *M. Azadirachta* possess almost the same medical properties as the oil, but they require to be bruised and mixed with water

or some other liquid before they can be applied to the skin or ulcers, and their use is, therefore, attended with so much inconvenience that they cannot be resorted to at all, except in those places where the oil is not procurable. A strong decoction of the fresh leaves is a slight antiseptic, and is useful like a weak carbolic lotion in washing wounds and ulcers, and syringing out the vagina in the after-treatment of parturition, &c. When the pustules of small or cow-pox burst and begin to ulcerate, the Hindu medical practitioners invariably recommend the application of the paste of the fresh margosa leaves two or three times in the twenty-four hours, and speak highly of its healing power. As the paste is a slight stimulant and antiseptic, I thought the supposition of the Vythians is not without foundation, and therefore watched some of the cases under its use and found the result to be good in all the slight and ordinary cases. In some severe forms of ulceration from small-pox, however, it proved quite useless, as naturally expected. On the whole, the use of the paste is quite justifiable in many slight and ordinary cases of ulceration from the pustules of small or cow-pox. The aroma of the fresh or recently dried leaves is sufficient to prevent the attack of insects, and they are therefore often placed in books and clothes by the natives of this country; but they are much inferior to camphor in this respect.

The flowers are useful in some cases of atonic dyspepsia and general debility. The gum being bestowed with a slight tonic action in addition to its demulcent property, it is a better auxiliary to other remedies than Gum Arabic and Feronia gum in catarrhal and other affections, particularly when the latter are accompanied by great debility. The toddy of the margosa tree appears to be of great service in some chronic and long-standing cases of leprosy and other skin diseases, consumption, atonic dyspepsia and general debility, and although I have not prescribed it myself, I am acquainted with several persons who praise the drug very highly from personal use and observation. It is, however, extremely scarce, and this is a great drawback to its use and adoption into general practice.

Preparations.—Of the root-bark, bark and young fruit—Decoction, tincture and powder. Decoction: Take of the inner layer of the root-bark, cut into small pieces, four ounces; water, two pints; boil on a slow fire till the liquid is reduced to one pint, and strain while hot. The decoction of the bark is prepared in precisely the same manner, and in both cases the fresh bark is preferable to the dry and old one. In preparing the decoction of the fruit, they should be selected when they are very young or before attaining half of their natural size; cut into small slices and dry in the sun; and then their proportion to the water and the method of boiling and straining are exactly the same as in the decoction of the root-bark. Tincture: Take of the inner layer of the root-bark or bark, in coarse powder, four ounces; alcohol or proof spirit, one pint; macerate for seven days in a closed vessel with occasional agitation, press, filter and add more spirit, if necessary, to make one pint. Powder: The inner layer of the root-bark or bark, or the dry young fruit, may be reduced to powder, passed through a fine sieve and kept in a closed vessel. Of the leaves, nuts and oil—Decoction, paste or poultice and solution. Decoction: Take of the fresh leaves, four ounces; water, two pints; boil till the liquid is reduced to half of its quantity, and strain when cool. Paste or poultice: Bruise

and rub the fresh leaves with hot or cold water in a stone mortar till they are reduced to a soft and pulpy mass. Solution: Bruise and rub the kernel of the nuts with cocoanut oil, water or some other liquid, in a mortar till it becomes well mixed and thin. The oil is either applied by itself or in combination with other drugs, as chaulmugra oil, &c. Of the flowers—Infusion: Take of the flowers, three ounces; hot water, one pint or just sufficient to cover the flowers; infuse in a covered vessel for an hour and strain. Of the gum—Mucilage, which is prepared in the same way as the corresponding preparation of the Indian Gum Arabic under the head of *Preparation*, in the article *Acacia Arabica*. Of the toddy—There is no preparation of the sap or margosa toddy, it being always used alone.

Doses.—Of the decoction of the root-bark, bark or young fruit, from one and a half to three fluid ounces; of the tincture of the root-bark or stem bark, from one to three fluid drachms; and of the powder of any of the above drugs, from one to two drachms; three or four times in the twenty-four hours. Of the infusion of flowers, from one and a half to three fluid ounces; of the mucilage of the gum, from one to two fluid ounces; and of the toddy, from two to four fluid ounces; three or four times in the twenty-four hours.

European Drugs for which they may be substituted.—The root-bark, bark and young fruit, for cinchona-bark and gentian; the oil, nuts and leaves, for carbolic acid; the flowers, for elder flowers, and coriander, aniseed and dill oils; the gum, for acacia and feronia gums; and the toddy, for elm bark, diluted phosphoric acid, Jamaica sarsaparilla and chaulmugra and codliver oils.

Remarks.—No less than nine parts of the margosa or nim tree are employed in medicine, and I am not aware of any other plant which produces so many drugs.

The bark of this tree "varies much in appearance according to the size and age of the tree producing it. The bark from the trunk of a tree, above three or four years of age, is covered with a thick scaly epidermis, and varies in thickness from one-fourth to half an inch. That from the small branches is smooth, of a dullish purple color, marked by longitudinal lines of ash-colored epidermis, from one-eighth to one-twelfth of an inch apart. The inner layer of the bark, of a whitish color in the fresh state, is powerfully bitter, far more so than the outer dark-colored layer, which, however, possesses a greater amount of astringency." (*Pharm. of India*, pp. 53 and 54.) "On making a transverse section three distinct layers may be observed:—firstly the suberous coat exhibiting a brown parenchyme interwoven with small bands of corky tissue,—secondly a dark cellular layer, and then the foliaceous liber. The dry bark is inodorous and has a slightly astringent bitter taste." (*Pharmacographia*, p. 136.) There is no difference between the physical characters of the bark and those of the root-bark, or, if there is any at all, it is only this, namely, the latter is generally thinner, less scaly, more bitter in taste and much stronger in its actions than the former.

The sun-dried slices of the young fruit are pale-green externally and dullish-white internally, and bitter in taste. The Margosa-oil is reddish or brownish yellow, very bitter, nauseous and slightly acrid

in taste, with a peculiar and somewhat disagreeable smell. The nuts are oval and pale or greyish-brown with a thin and brittle shell, and an oily and very bitter kernel. The dry flowers are very small, pale or yellowish white, and possess a slight and peculiar aroma when recently dried. The gum is found in small and roundish tears, translucent, generally reddish in color but sometimes clear and colorless, and possesses, when new, a slightly bitterish taste.

The nim or margosa toddy is an important therapeutic agent and requires a special notice. This toddy or sap is yielded either spontaneously or extracted artificially. In the former case, a clear and colorless liquid begins to flow in a very thin stream or continuous drops from two or three and sometimes more parts of the plant, and continues to do so from three to seven weeks. The trunk and large branches and roots are the parts from which the flow takes place through very small and recent cracks or fissures, and the quantity of the liquid discharged in the 24 hours from the whole tree varies from 2 to 8 bottles according to its size. Of the several margosa trees in Madras and its vicinity known to yield occasionally the sap under discussion, there was one in Mylapore which enjoyed the greatest repute in this respect. This plant was in a small street at the southern end of the above village and died about 15 or 16 years ago. It was a pretty large tree, about 50 or 60 years old, and produced the sap every 3rd or 4th year. After the last or 4th occasion, the trunk became rapidly hollow and the plant dried soon after this. On each occasion, before the sap began to flow, there was always, for 3 or 4 days, a distinct and peculiar rushing or pumping noise of a liquid within the trunk, and did not entirely cease till the discharge actually commenced from 3 or 4 parts of the plant. This is more like an animal or vital phenomenon than anything else.

The above phenomenon being a sure forerunner of the flow of the sap, as just explained, the owner of the plant (Faiz Ahmed Khan) always gave notice of its occurrence to all his neighbours and many other persons, with a view to be prepared to avail themselves of this extremely rare medicine if they were in need of it. The fame of the sap as a curative agent was certainly so great that the plant was surrounded by people morning and evening, who bought and drank the drug very eagerly. The price of it was very variable, but generally between 4 and 10 annas per bottle, and at one time it rose to a rupee for the same quantity. The sap was more or less bitterish in taste with a slight and peculiar aroma of the nim tree, and was never known to ferment or possess any intoxicating property. The word *toddy* is, therefore, not correctly applicable to this liquid drug. I have already mentioned the diseases which were most benefited by its use under the heading of "*Therapeutic Uses.*"

The nim trees which yield the sap artificially seem to be more rare, for I have heard only of 3 or 4 of such plants. All these are said to have been pretty young and large trees, and were found near water or on the banks of nullas or water-courses which were constantly wet. The sap was extracted from them in the following manner:—A moderate-sized and fresh-looking root being exposed by removing the earth, it was either cut through or only to half of its circumference from below, and then a vessel was placed beneath to receive the liquid,

which began to dribble or flow in a very small and thin stream. The sap thus collected is supposed to be identical with that produced by the tree spontaneously, but comparatively very small in quantity, amounting generally to only from 2 to 6 bottles in the 24 hours. I think if many of the margosa plants growing near water be tried in the manner I just explained, a much larger percentage of them will be found capable of yielding the liquid than is generally supposed at present.

The nim or margosa trees are bestowed with another property, which is much more important than any of those I have already mentioned. I allude to the healthiness they impart to the atmosphere. Some villages in South India are known to be quite free from cholera from the time it came into existence, and this immunity is attributable to their being surrounded by, or containing a much larger number of, those trees than usual. Although I am not personally acquainted with any of such villages, I am aware of some houses which enjoyed a similar exemption from cholera during its epidemics, while all other surrounding and adjoining houses suffered repeatedly from its visits. My own house is the best example of this kind. I live in Royapettah, opposite to the Triplicane Dispensary, and my house is separated from the latter only by a road. The Hospital attached to this Dispensary, which is commonly known as the Royapettah Hospital, being the only Hospital in Madras on the south of the Mount Road, in which the sick are treated as in-patients, a large number of cholera cases are admitted into it from all the neighbouring and adjacent villages during every epidemic of that disease. The result is that Royapettah seldom or never escapes cholera whenever it prevails epidemically in any part of the southern half of the city of Madras, and often suffers from it more extensively and for a longer period than many other parts. In a locality like this, where the epidemics of cholera are so frequent and prolonged, as just explained, my house has escaped the visits of that disease during the last 25 years, while all others in the immediate vicinity of the Royapettah Hospital suffered from it repeatedly during the same period. The only reasonable and chief difference between my own and other houses is, that the former was always surrounded by some nim or margosa trees, while the latter were not.

The margosa tree is also useful as a preventive to fever, as will be seen from the following quotation :—

"The air passing through nim trees is thought to be highly beneficial to health, and hence the practice among the natives of planting nim trees near their dwelling houses. Many Europeans even believe in this, specially in the North-Western Provinces and Oude, and frequently cite villages surrounded with nim trees as proverbially free from fever, while adjoining villages have suffered severely." (*Preliminary List of the Economic Products of India, by Dr. George Watt, M.B., C.M., F.L.S., Part V, pp.* 219 *and* 220.)

It is clear from what I have explained above that the nim or margosa tree is not only very useful and important for medicinal purposes, but also from a sanitary point of view, and deserves, therefore, the greatest attention of both the public and the medical profession. If possible, this tree alone ought to be selected for avenues, particularly in cities, towns and villages, and the people should be encouraged to plant it around or near their dwelling houses.

CELASTRINEÆ.

† Celastrus paniculata, *Willd.* 181, 182, 183 and 184.

Habitat.—Nílgiris, hilly parts of the Concans, and some dry and elevated jungles in South India.

Part Used.—The seeds, fixed oil and a compound empyreumatic oil.

Synonyms.—Of the seeds—Seeds of the Staff-tree, *Eng.* Málkangní-Ké-bínj, *Hind.* and *Duk.* Váluḷuvai, Valuḷuvai-virai, Atipari-cham, *Tam.* Málkanguni-vittulu, Gunḍumeḍa, *Tel.* Valu-zhuva or Váluḷuva, *Malyal.* Malkangni, *Beng.* Málkángóni, *Mah.* Of the fixed oil.—The oil of the Staff-tree, *Eng.* Málkangní-ká-tél, *Hind.* and *Duk.* Váluḷuvai-eṇṇey, *Tam.* Málkunguni-núne, *Tel.* Váluḷuva-eṇṇa, *Malyal.* Málkanguni tail, *Beng.* Mál-kángóṇi-cha-téla, *Mah.* Of the compound empyreumatic oil.—Black oil, *Eng.* Málkangní-ká-jantar, *Duk.* Váluḷuva-tailam, *Tam.* Málkanguni-tailamu, *Tel.*

Local Sources.—The seeds **(No. 181)** are pretty common in the bazaar; the fixed oil **(No. 182)** is not generally sold, and the black oil or *Oleum nigrum* **(Nos. 183 and 184)** requires to be sent for from Vizagapatam, Ellore, Masulipatam and a few other places in the Northern Circars.

Price.—Of the seeds—Wholesale, Rs. 5 per maund; retail or bazaar, As. 6 per pound. Of the black oil—Rs. $1\frac{1}{2}$ per bottle, which generally contains one pollum of the oil.

Physiological Actions.—Diuretic, diaphoretic, stimulant and nervine tonic.

Therapeutic Uses.—Black oil is the best medicine for Beriberi, and although the fixed oil of the seeds also possesses the diuretic and stimulant properties, it is in so slight a degree that it forms only a weak substitute for the former. The seeds bruised and formed into a poultice is a good stimulant application to foul, unhealthy and indolent ulcers.

Preparation.—*Oleum nigrum* or black oil is a compound and empyreumatic oil obtained by a destructive distillation of the seeds of *Celastrus paniculata* with several other ingredients, and is generally, if not solely, manufactured in some places in the Northern Circars. There are several varieties of this oil, but those prepared in Vizagapatam, Ellore and Masulipatam are the best and most efficacious according to my own experience. The following graphic description of the preparation of *Oleum nigrum* occurs in Dr. E. J. Waring's *Manual of Practical Therapeutics*, p. 35:—

"Into an earthen pot, the bottom of which is perforated by a number of small holes, are put the seeds of *Celastrus nutans* (Malkungee, *Hind.*), ℔ iss., benzoin, cloves, nutmegs, and mace āā ʒ ss; the mouth is closed, and the pot, placed over another, is luted to it. They are then placed in a pit three feet deep and nearly as wide, and surrounded by cakes of dry cow dung, which are set on fire; and when they are consumed, about ʒ vi of the oil is found in the under vessels, ready for use. It should be kept in well-closed vessels. Sp. gr. 0·975. The Malkungnee seeds are the active ingredients."

Doses.—Of the black oil, from ten to thirty minims, three or four times in the twenty-four hours; and of the fixed oil, from twenty minims to one fluid drachm, gradually increased.

European Drugs for which they may be substituted.—Juniper, sp. æther. nit., buchu, broom, phosphates, hypophosphites and strychnia.

Remarks.—The seeds of *C. paniculata* " are of a rusty brown color, of an ellipsoid form, about one-fifth of an inch in length, leaving when crushed on paper an only stain. Remains of the globular three-valved fruit, which is of the size of a pea, are usually found mixed with them." (*Pharm. of India*, p. 56.) The oil extracted from these seeds by compression (fixed oil) is yellow or reddish yellow with a peculiar and rather disagreeable taste and smell. The compound empyreumatic oil (black oil), is very black and about the thickness of honey. It possesses a very peculiar and characteristic taste and smell, both of which being very smoky, unpleasant and somewhat aromatic. *Oleum nigrum* or black oil is a specific in Beriberi, but before I speak of it from my own experience and knowledge, I think it is better to give the reader first the benefit of the opinions of the two great authorities on the drug, namely, Drs. Herklots and Malcomson, as explained by Dr. E. J. Waring in his *Manual of Practical Therapeutics*, p. 347 :—

" In *Beriberi*, it was first employed by the late Dr. Herklots, who states that he lost 1 in 50 cases of Beriberi treated by it (meaning *black oil*), while he had 11 deaths out of 15 before he adopted its employment. Although it is generally admitted to be a valuable remedy in this disease. no such success has attended its employment in the hands of others. Mr. Malcomson relates cases in which its effects were most unequivocal, but he states that he knows of many cases in which it failed to produce any good effect; and I believe this to be the experience of most medical officers who have employed it. Mr. Malcomson concludes that the *Oleum nigrum* possesses more power over the nervous affections than Treeak Farook (+++) and less over the œdema and the dropsical symptoms generally."

As already explained, there are several varieties of *black oil* or *oleum-nigrum*, and as they are all not of the same quality and efficacy, the results of their use are necessarily very various. There is no wonder, then, that the opinions of the medical officers, who have employed the medicine, are so widely divided as those in the paragraphs quoted above.

I have been using the *black oil* myself occasionally in my practice during the last thirty-nine or forty years, and, for about fifteen years at the commencement of this period, my opinion as to its therapeutic value was not very high; but, ever since I began about twenty-five years ago to employ the varieties of this drug obtained from Vizagapatam, Masulipatam and Ellore, I consider it the best and most efficacious of all the remedies ever suggested for the treatment of Beriberi, and quite agree with Dr. Herklots in everything he has said in its favor. I recollect many cases of Beriberi which were not benefited for weeks or months under the use of other medicines, but began at once to improve when placed under the course of *black oil.* The first good effect of this medicine, according to my own observation, is generally an increase in the quantity of urine and with this the dropsical effusion begins to disappear. A relief in paralytic and anesthetic symptoms is also noticed about the same time, but generally after the abatement of

dropsical symptoms. During the use of *black oil*, the native practitioners invariably enjoin a very low and strict diet, giving nothing to the patient except water and wheaten cakes for a long period—a restriction which is as injurious as unnecessary in my opinion. The patients labouring under Beriberi require a very liberal and nourishing diet. I have also used this oil in some simple and uncomplicated cases of dropsy, and with good and encouraging results.

The seeds are supposed to have the property of stimulating the intellect and sharpening the memory. The oil is used in the courts and colleges by a great many pundits and munshies to increase the intelligence of their pupils.

RHAMNEÆ.

† Ventilago Madraspatana, *Gærtn.* 185.

Habitat.—Abundant in Western Mysore.

Part Used.—The root-bark.

Synonyms.—Súrí-chakká, *Duk.* Pappili-chakkai, Vembádam, *Tam.* Súraṭi-paṭṭa, Suraḷa-tége-paṭṭa, Yerra-chakatli-chakka, Suriṭipeṭṭe-chakka, *Tel.* Pupli-chakka, *Can.* Raktavalli, *Sans.*

Local Sources.—The bark is sold in some large bazaars of South India.

Price.—Wholesale, Rs. 6 per maund; retail or bazaar, As. 5 per pound.

Physiological Actions.—Carminative, stomachic, tonic and stimulant-diuretic.

Therapeutic Uses.—Useful in atonic dyspepsia, debility and slight cases of fever, and externally for cutaneous eruptions.

Preparation.—Simple powder, which is prepared in the usual way and kept in a stoppered bottle.

Doses.—From thirty to ninety grains three or four times in the twenty-four hours.

European Drugs for which it may be substituted.—Cascarilla, pimento, calumba and cinchona.

Remarks.—The bark occurs in very thin and light pieces, varying generally in length from $\frac{1}{4}$ to $2\frac{1}{2}$ inches, and in breadth from 1 to 6 lines. It is of a brown or reddish-brown color, odoriferous but almost tasteless. As sold in the bazaar, it contains a large quantity of small scaly pieces of its epidermis, which are still thinner, lighter and darker in color.

† Zizyphus Jujuba, *Lamk.* 186.

Habitat.—Cultivated in every part of India.

Part Used.—The fruit.

Synonyms.—The Indian jujube, *Eng.* Bér, *Hind.* and *Duk.* Elandap-pazham or Elanda-paṛam, *Tam.* Régu-paṇḍu, Ganga-régu-haṇṇu, *Can.* Kúl, Bér or Bór, *Beng.* Badari-*ph*alam, *Sans.* Bóra, *Mah.* Bór, *Guz.* Ilanda, Másankâ, *Cing.* Zísi, *Bur.*

Local Sources.—The dry fruit is occasionally sold in the bazaar.

Price.—Wholesale, Rs. 7 per maund ; retail or bazaar, As. 6 per pound.

Physiological Actions.—Demulcent, nutrient and febrifuge.

Therapeutic Uses.—I have not yet used this drug separately, but employed it always in combination with other and stronger febrifuge medicines.

Preparation.—It is one of the ingredients of the compound decoction of *Viola odorata*, which, as already explained, is very useful in certain forms of fever. (See under *Viola odorata*)

Remarks.—The Indian Jujube in Madras is generally spherical and about twice or thrice the size of a soap-nut; but the fruit found in Kurnool, Cawnpore, Furrukhabad, Aurungabad and many other parts of India is generally oblong and often as large as a date. The dry fruit is much shrivelled, smooth, shining, yellowish-red or reddish-brown, and the pulp it contains is as nearly sweet as in the fresh state. The bark of the tree is astringent.

AMPELIDEÆ.

‡ Vitis setosa, *Wall.* 187.

Habitat.—Rajahmundry, Mysore, Nellore, &c.

Part Used.—The leaves.

Synonyms.—Yék-qisam-ká-bachlá, *Duk.* Puli-péraṇḍai, *Tam.* Pulla-bachchala, Barre-bachchala, *Tel.*

Local Sources.—Not sold in the bazaar.

Physiological Actions.—Local stimulant.

Therapeutic Uses.—Useful in the form of poultice, in sloughing and fœtid ulceration, and also in boils and small abscesses for the purpose of hastening suppuration, and for assisting in the extraction of guinea-worms.

Preparation.—Poultice, prepared by bruising the fresh leaves with or without water.

European Drugs for which it may be substituted.—Yeast poultice.

* Vitis vinifera, *Linn.* 188 and 189.

Habitat.—N.-W. Himalayas, cultivated elsewhere.

Part Used.—The fruit.

Synonyms.—Of the fresh fruit—Grapes, *Eng.* Angúr, Dákh, *Hind.* Angúr, *Duk.* Koḍi-mundrip-pazham, Diráksha-pazham or Diráksha-paṛam, *Tam.* Dráksha-panḍu, Góstini-panḍu, *Tel.* Munti-rinnap-pazham or Muntri-paṛam, *Malyal.* Drákshi-haṇṇu, *Can.* Angúr, Drakhyá, *Beng.* Dráksha-phalam, *Sans.* Dráksha, *Mah.* Drákh, *Guz.* Mudra-paḷam, Mudraká, *Cing.* Ṣabí-ṣí Ṣabya-ṣi, *Bur.* Ainab or Aanab, *Arab.* Angúr, *Pers.* Of the ripe fruit dried in the sun or with artificial heat—Raisins, *Eng.* and *Fr.* Rosinen, *Ger.*

Monaqqá, *Hind.*, *Duk.* and *Pers.* Ularnda-diráksha-pazham or Ularnda-drácha-paṛam, *Tam.* Enḍu-dráksha-panḍu, Dípa-draksha-panḍu, *Tel.* Uṇaṉṉiya-muntrinap-param, *Malayl.* Dípa-drakshí, *Can.* Monak*kh*a, *Beng.* Vellic*h*-*ch*a-mudra-paḷam, *Cing.* Zabíb-mavéz, *Arab.* Of the small variety of raisins without stones—Sultána, Raisins, *Eng.* Kis*h*mis*h*, Bédánah, *Hind.*, *Duk.* and *Pers.*

Local Sources.—Plentiful in every large bazaar of India.

Price.—Of the grapes—Wholesale, Rs. 5 per maund; retail or bazaar, As. 4 per pound. Of the common variety of raisins (**No. 188**)—Wholesale, Rs. 2½ per maund; retail or bazaar, As. 3 per pound. Of the small variety without stones (**No. 189**)—Wholesale, Rs. 3½ per maund; retail or bazaar, As. 4 per pound.

Physiological Actions.—Grapes are refrigerant, diuretic and antipyretic. In large doses, raisins act as a demulcent, expectorant and laxative; and in smaller ones, as an astringent.

Therapeutic Uses.—The *sharbat* or syrup of grapes is a very pleasant and cooling drink, and proves very useful in relieving thirst and other pyrexial symptoms in many forms of fever. I have also used it with advantage in ardor-urinæ, dysuria, strangury and some cases of bilious dyspepsia. It is one of the best and most agreeable vehicles for other medicines, particularly those used in dyspepsia, dysentery, diarrhœa and dropsical affections. From their combined actions of demulcent, expectorant and laxative, raisins are a frequent ingredient in Muhammadan prescriptions for catarrhal and febrile complaints. They enter into the composition of Tinctura Cardamomi Composita and Tinctura Sennæ (*Pharm. of India*, pp. 230 and 66, respectively). They also form an ingredient in one of my own formulæ for certain forms of fever (see under *Viola odorata*). There is little or no difference between the medicinal properties of the common variety of raisins and those of the small one without stones.

Preparation.—Syrup or *sharbat:* Take of the juice of ripe grapes and of water, two and three pounds, respectively, by weight; refined sugar, four pounds; dissolve the sugar in the water with the aid of heat, add the juice, and then boil the whole liquid on a very gentle fire till it is reduced to two-thirds of its quantity.

Dose.—Of the syrup, from half to one fluid ounce, 5 or 6 times in the 24 hours. Of the raisins, from half to one ounce, 3 or 4 times in the 24 hours.

European Drugs for which they may be substituted.—Grapes for tartaric and citric acids; and raisins for Manna and Prunes.

Remarks.—The grape is a succulent berry, generally ovoid or spherical, sweet and delicious in flavour. The raisins commonly found in Indian markets are from half to one inch long and from quarter to half broad, shrivelled, compressed, smooth but more or less moist and therefore sticking to each other; pulp soft and agreeably sweet; seeds small and slightly bony. The raisins in the small and stoneless variety (*Kishmish angul drakh*, Pers. and *Sultanas*, Eng.) are about one half smaller in size and much paler in color.

Cream of tartar, Port and Sherry wines, wine-vinegar, alcohol and tartaric acid are prepared, directly or indirectly, from the juice of grapes.

† **Vitis quadrangularis,** *Wall.* **190.**

Habitat.—Pretty common in the jungles of South India.

Part Used.—The stem.

Synonyms.—Nallar, Hár-jóṛá, *Hind.* Nallér, *Duk.* Pirandai, *Tam.* Nalléru, *Tel.* Viranṭa, Piranṭa, *Mal.* Mangarúḷi, *Can.* Hórjóṛá, Hár*bh*ángá, *Beng.* Vajra-vallí, *Sans.* *Ch*ódh*á*ri, *Guz.* *Sh*azánlese, *Bur.*

Local Sources.—Sold by, or obtained through, the herb-sellers in the bazaar.

Price.—Wholesale, Rs. 2 per maund; retail or bazaar, Anna 1 per pound.

Physiological Actions.—Stomachic and alterative.

Therapeutic Uses.—Used with benefit in dyspepsia.

Preparation.—Preserve: Cut a fresh and tender stem into small pieces; puncture each piece deeply with a thorn in many places and on all sides; boil the pieces in water till they become soft; throw off the liquid and subject them to a moderate pressure between two planks. Boil the pieces again in lime-water, or in water in which carbonate of soda to the proportion of ℥ i to ℥ iv is previously dissolved, and throw off the liquid as before. Repeat the last process once or twice more, or until the pieces are very soft and quite free from any acridity on chewing; and then wash with pure warm water, wipe with cloth and put them in a simple syrup of sugar. After a week they will be ready for use.

Dose.—From two to four drachms (by guess) 2 or 3 times in the 24 hours.

European Drugs for which it may be substituted.—Peppermint and caraway.

Remarks.—The fresh stem is deep or pale green in color, four-angled, winged and jointed, each joint varying in length from 2 to 4 inches. Very acrid in taste, and the acridity appears to depend upon an acid;* hence the necessity of boiling it repeatedly in lime-water, or water in which soda is dissolved, in preparing the preserve of the drug. The sole cause of my inserting *V. quadrangularis* in this work is, that I knew a man in Triplicane, who was subject to a chronic and obstinate dyspepsia for a long time, was cured of it after the use of the preserve of this drug for 40 days.

SAPINDACEÆ.

‡ **Cardiospermum Halicacabum,** *Linn.* **191.**

Habitat.—Pretty common in the plains and hedges of South India.

Part Used.—The leaves.

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* The acridity of the stems of this and other species of Vitis is due to the occurrence of needle-shaped crystals of calcium oxalate (raphides), which act as a mechanical irritant. By drying the plant the crystals are broken, and by boiling in water they are removed. The preparation of the preserve described above would be quite innocent of any medicinal activity.— D. H.

Synonyms.—Heart pea, *Eng.* Kán-phúṭí-ká-pát, *Hind.* Ghan-phóṛ-ká-pattá, *Duk.* Múdak-kattán-ilai, *Tam.* Buḍḍa-kákara-áku, Ekkuḍu-tíge-áku, Vekkuḍu-tíge-áku, Upparinta-áku, Ullena-tíge-ákú, Paṭali-tivva-áku, *Tel.* Naya-phaṭki-pátá, Latá-phaṭkari-páta, *Beng.* Jyótishmati-patram, *Sans.* Kán-phúṭi-cha-páná, *Mah.* Kán-phúṭi-nu-pándṛu, *Guz.*

Local Sources.—Not sold in the bazaar, but can be obtained easily in the rainy season through the herb-sellers.

Physiological Actions.—Cathartic, probably due to saponin, and a remedy in rheumatism.

Therapeutic Uses.—Useful in acute rheumatism.

Preparation.—The juice of the fresh leaves obtained by bruising and rubbing them in a mortar without water.

Dose.—Dose of the leaves, from two to three ounces.

European Drug for which it may be substituted.—Colchicum.

Remarks.—The Hindu practitioners in South India, especially those in villages, frequently employ the leaves and root of *C. Halicacabum* in the treatment of several diseases, including rheumatism, gravel and calculi; but I have only seen the juice of the leaves, in about three-ounce doses, producing a good and satisfactory result in two cases of acute rheumatism. In each of these cases the drug acted upon the bowels and produced four or five loose motions, but the relief it afforded to the pain and other symptoms of rheumatism was distinctly more than that generally observed in the same disease under the use of ordinary purgatives. This is the chief cause of my including the above plant in this work.

‡ Sapindus trifoliatus, *Linn.* 192 and 193.

Habitat.—Cultivated, and also common in dry jungles.

Parts Used.—The pericarp or pulp, and kernel of the fruit.

Synonyms.—Of the fruit (**No. 192**)—Soapnut, *Eng.* Ríṭhá, *Hind.* and *Duk.* Ponnáṉ-koṭṭai, *Tam.* Kunkuḍu-káyalu, Kukuḍu-kayalu, *Tel.* Urvanjik-káya, Ponnan-koṭṭa, *Malyal.* Kúkate-káyi, *Can.* Ríṭhá, *Beng.* and *Mah.* Arishṭa phalam, Phenila, *Sans.* Ariṭha, *Guz.* Miavmeṇ-sue-khé-ṣi, Meávme-sue-khati, *Bur.* Of the kernel of the seed—Riṭhé-ké-bínj-ká-maghz, *Hind.* and *Duk.*

Local Sources.—The soap-nut is one of the cheapest and commonest drugs in India.

Price.—Wholesale, As. 12 per maund; retail or bazaar, Anna ½ per pound.

Physiological Actions.—Internally, emetic, nauseant and expectorant; through the nose, a remedy in hemicrania, asthma, hysteria and epilepsy; and externally, detergent, and a remedy for the stings and bites of poisonous insects, as scorpion, centipede, &c.

Therapeutic Uses.—As an emetic, nauseant and expectorant, the pericarp or pulp of soap-nut is quite equal to ipecacuanha, if not superior to it, and is very useful in all the affections in which the latter is indicated. The emetic action of soap-nut always relieves asthma to

more or less extent, and generally more speedily than ipecacuanha and *Tylophora asthmatica;* and it is also useful in the same way in some cases of colic, particularly when the latter is depending on indigestion. A thick watery solution of the drug is often resorted to by the natives of this country for the relief of hemicrania, hysteria, and epilepsy. They drop a few drops of the solution in each nostril during the fit of any of the above diseases, and it produces a temporary relief by irritating the mucous membrane and increasing its secretion, which flows out by the nostrils or the mouth, or by both. I gave a trial to this plan of treatment in my own practice not only in the above maladies, but also in asthma, and the result is pretty favourable. There was more or less relief in almost every case of hemicrania and asthma in which the solution was tried; but the cases of hysteria and epilepsy benefited by it were very few. Although the relief afforded by the solution is always temporary, yet it is in many cases instantaneous. The quantity of the solution must not be more than four or five drops in each nostril, for in one case in which it exceeded ten or twelve drops, the irritation of the membrane was severe and lasted for one or two days. Applied in the form of paste or poultice over the parts stung or bitten by some poisonous insects, as scorpion, centipede, &c., the pulp of soap-nut relieved the pain in two or three cases to my own knowledge. When bruised and agitated in water, it forms suds like soap, and in this condition is an efficient detergent and very useful for washing and cleaning the body, linen and hair. The kernel of the seeds is sweetish, nutrient, and yields an oil on expression, which is a very good substitute for almond oil.

Preparations.—The pulp or pericarp of soap-nut can only be administered conveniently in the form of draught, which is easily prepared by rubbing and bruising it in one or two ounces of water and passing the same through cloth. A thick solution of the drug for dropping into the nose is prepared in the same way with a very small quantity of water (say equal proportion of both by guess). The juice may be strained and kept in a bottle for use for a day or two, or squeezed into the nostrils then and there through the cloth. In preparing the paste or poultice of this medicine, vinegar or lime-juice should be used instead of water.

Doses.—From one drachm and a half to two drachms as an emetic; from twenty to forty grains as a nauseant; and from ten to eighteen grains as an expectorant. As a nauseant and expectorant, the medicine should be repeated three or four times in the twenty-four hours.

European Drugs for which it may be substituted.—For ipecacuanha sulphate of zinc, squill and senega as an emetic, nauseant, and expectorant; for carbonate of ammonia, hypodermic injection of morphia, and liquor ammoniæ, as a remedy through the nose and as a local application.

Remarks.—The dry soap-nut, as sold in the bazaar, is generally single, spheroidal, about $\frac{3}{4}$ inch in diameter, wrinkled and reddish brown or brownish yellow in color, with a large, heart-shaped, whitish and woody scar at the base. The scar is divided into two slanting surfaces with a thin and prominent ridge, indicating the attachment of two other nuts originally. The pericarp is about a line and a half thick,

with a soft, viscid, and translucent pulp, and, however long it may be exposed to the sun, it does not get sufficiently dry to be pulverised. The inner membrane or shell enclosing the seed is thin, tough, translucent and leathery. The taste of the pulp is sweetish bitter, and the smell bears some resemblance to that of a very ripe and decomposing mango, or the compound extract of colocynth (butyric acid). The active principle of the soap-nut is *saponin*, which occurs to the extent of about 10 per cent. in the pulp.

The seed of the fruit is roundish, black, smooth, and about the size of a large pea; and the kernel is yellowish or pale-white, oily and sweetish in taste.

I have been using the pericarp of soap-nut in my practice for the last several months, and have just (August 1887) discovered it to be one of the best, cheapest and commonest emetics in India. While it is as safe as ipecacuanha and several other vegetable emetics, it is decidedly more speedy in its action than all those drugs. It is, however, required to be employed in much larger dose than ipecacuanha; but this is no disadvantage, for it is always administered in the form of draught, and this draught is less nauseous and unpleasant than that of ipecacuanha and many other emetics. As an emetic, the soap-nut well deserves to be brought into general use by the medical profession.

Soap-nut is supposed to be a good anthelmintic in some native medical works in four or five grain doses, but this is not really the case. I have used it in very large doses (℥j to ℥ij) in many cases. and its emetic action was sometimes accompanied by one or two loose motions; but I have neither seen nor heard of any of my patients passing a single round or any other abdominal worm on any occasion. The root of the soap-nut tree is woody, very hard and quite inert. The root-bark and bark, however, contain the vegetable principle *saponin* and form froth like soap when bruised and agitated in water. I have used each of these drugs in decoction, and in large and repeated doses, and found them to be very mild expectorant and demulcent. As medicines they are so weak that I did not consider them worthy of being treated as such.

ANACARDIACEÆ.

* Pistacia Lentiscus, *Linn.* 194 and 195.

Habitat.—Southern Europe, Northern Africa and the Levant.

Part Used.—The resinous exudation.

Synonyms.—Mastich, *Eng.* Mastic *Fr.* Mastix, *Ger.* Rúmí-masṭakí, *Hind.* and *Duk.* Kíyá, Kundure-rúmí, *Pers.* Alake-rúmí, Məsṭakí, *Arab.*

Local Sources.—The true mastich is not found in the bazaars of South India, and what is sold here under the same vernacular names is the drug imported from Bombay, which should properly be called the Indian, East Indian, Cabul or Bombay mastich, and which is now proved to be the produce of *Pistacia Terebinthus.* (See the following article.) The true drug or the resinous exudation of *P. Lentiscus*, however, is often found in the possession of some rich Muhammadans in Madras and other parts of Southern India.

Physiological Actions.—Stomachic, expectorant, masticatory, stimulant-diuretic, local stimulant, and also possesses some good influence over the membrane of the genito-urinary organs.

Therapeutic Uses.—Useful in dyspepsia, gonorrhœa and some slight cases of catarrhal affections. Some Muhammadan gentlemen in Madras are in the habit of using mastich for removing the foulness of their breath whenever it is necessary to do so, and I am myself aware of success attending a few cases of this nature. They either chew the drug occasionally for this purpose, or put a small quantity of it every day in the goblets with their drinking water for some days. An oily solution of this drug is also a good and useful embrocation in some cases of muscular and other forms of rheumatism.

Preparations.—I have used mastich internally only in the form of draught, mixed either with mucilage or with sugar and water. Oily Solution: Take of mastich one ounce; olive, cocoanut or jinjily oil, four fluid ounces; mix them together by gently heating in a mortar, and keep the solution in a closed bottle.

Doses.—From fifteen to forty grains, three or four times in the twenty-four hours.

European Drugs for which it may be substituted.—Ammoniacum, Armoraciæ-radix and Copaiba.

Remarks.—As already mentioned, the true mastich is not sold in the bazaar, but found in the possession of some rich Muhammadan gentlemen at Madras, who are fond of it and obtain it generally through the pilgrims returning from Mecca. There is an interesting article on the true mastich in the *Pharmacographia*, pp. 142–145, from which I quote the following description:—

"The best sort of mastich consists of roundish tears about the size of peas, together with pieces of an oblong or pear-shaped form. They are of a pale yellow tint darkening by age, dusty and slightly opaque on the surface, but perfectly transparent within. The mastich of late imported has been washed; the tears are no longer dusty but have a glassy transparent appearance. Mastich is brittle, has a conchoidal fracture, a slight terebinthinous balsamic odour. It speedily softens in the mouth and may be easily masticated and kneaded between the teeth, in this respect differing from sandarac, a tear of which breaks to powder when bitten. Inferior mastich is less transparent and consists of masses of larger size and less regular shape, often contaminated with earthy and vegetable impurities. The specific gravity of selected tears of mastich is about 1·06. They soften at 99° C., but do not melt below 108°. Mastich dissolves in half its weight of pure warm acetone and then deviates the ray of polarized light to the right. On cooling, the solution becomes turbid. It dissolves slowly in five parts of oil of cloves, forming even in the cold a clear solution; it is but little soluble in glacial acetic acid or in benzol."

Although the true and the Cabul varieties of mastich are almost identical in their medicinal properties, they differ much in some of their physical characters, which I shall explain under the plant yielding the latter (*P. Terebinthus*). Mastich, especially the true variety of it, bears a great resemblance to the small variety of *Kundur* (Olibanum or

the Indian frankincense) and also to small pieces or fragments of the large variety of the same drug, but it can be easily and readily distinguished from both by the water-test I have described in my remarks under the articles *Boswellia floribundu*, *B. glabra* and *B. serrata*.

† Pistacia Terebinthus, *Linn.* 196 and 197.

Habitat.—Afghanistan and Beluchistan.

Parts Used.—The galls and resinous exudation.

Synonyms.—Of the galls—Gule-pistah, *Pers.*, *Hind.*, and *Duk.* Buzghanj (Bombay). Of the resinous exudation—Indian, East Indian. Bombay or Cabul mastich, *Eng.* Maṣṭakí, Rúmí-maṣṭakí, *Hind.* and *Duk.* The native synonyms under which this variety of mastich is sold in the bazaar are the same as those which properly belong to the true mastich. The galls are also produced by an allied species, *P. vera*.

Local Sources.—The galls and the mastich under consideration are pretty common in every part of India, they being frequently and in large quantities imported from Bombay.

Price.—Of the galls—Wholesale, Rs. 8 per maund; retail or bazaar, As. 6 per pound. Of the mastich—Wholesale, Rs. 3 per viss; retail or bazaar, As. 1½ per pollum.

Physiological Actions.—The galls are astringent, and this mastich possesses the same medicinal properties as the true variety of that drug, but is more efficacious than the latter in some respects.

Therapeutic Uses.—I have never used these galls separately, but have always employed them in combination with some other drugs of the same nature, and they are an ingredient of the prescription, which I shall speak of under the heading of "*Preparations*" in the following article (*P. integerrima*). This prescription is very useful in cases of diarrhœa and dysentery, particularly those of children. The therapeutic uses of the mastich produced by this plant are similar to those of the true mastich, except that it is more useful in gonorrhœa and catarrhal affections than the latter.

Preparations and Doses.—I have administered the galls only in the form of compound-powder with some other astringent medicines, a prescription of which, together with its doses, will be spoken of under the next article, as mentioned above. The preparations and doses of this mastich are precisely the same as those which are already described under the preceding article (*P. Lentiscus*).

European Drugs for which they may be substituted.—The galls for oak-bark, log-wood and Botany Bay kino; and the mastich for Copaiba Ammoniacum and Armoraciæ-radix.

Remarks.—The following is a good and graphic description of the galls of *P. vera* from Dr. W. Dymock's *Vegetable Materia Medica of Western India*, p. 159:—"The galls when fresh are bright pink on one side and yellowish white on the other; they vary much in shape and size, some being perfectly fig-shaped and others almost spherical, the majority ovoid; at one end a portion of leaf often remains attached; here may be seen an open stoma which communicates with the interior of the sac; the apices are pointed, often

mucronate. The largest galls have a diameter of from $\frac{3}{16}$ to $\frac{6}{8}$ of an inch, some are no larger than a pea. The walls are thin, brittle, and translucent; the taste acidulous, very astringent and slightly terebinthinous; the odour terebinthinous. Most of the sacs contain only a little fæcal *debris*, but in some skeletons of an aphis may be found."

The resin of *P. Terebinthus* or Cabul mastich, which is the only variety met with in the bazaars of South India at present, occurs in tears or pieces of various shape, size, color and consistence. The larger tears, which vary in their broadest part from two to six lines, are more or less flat and *soft;* oval, circular, oblong or irregular in shape; pale-yellow or yellowish-white in color; dull, opaque and waxy in appearance; odour agreeable and slightly balsamic, and taste slightly terebinthinate. The smaller tears being generally dry, they are roundish, ovate or oblong, hard and brittle. There is no doubt that the larger tears have originally the same shape as that of the smaller ones, but being soft they become more or less flat afterwards by their own weight, &c. Although soft, the surfaces of the tears are not moist, and they therefore do not, as a rule, adhere to each other. Being already soft, this mastich becomes much softer and very ductile when chewed, and the chewed mass can be drawn without breaking to the length of 10 or 12 inches. It is entirely soluble in *ether*, and almost so in *alcohol;* perfectly insoluble in *water* and several *fixed oils*, including *oleum nucis*. I am almost sure that it is also insoluble in *all fixed oils*, but I have experimented only with 5 or 6 of them. It is nearly insoluble in turpentine.

The above description is applicable only to picked and clear tears of the Cabul or Bombay variety of mastich, but as found in commerce the drug is generally mixed with many masses of larger size and less regular shape, and of brown color, and often contaminated with earthy and vegetable impurities. As mastich is considered more valuable in the bazaar in proportion to the paleness and cleanliness of its tears, the native druggists take the advantage of its insolubility in water, and wash it well before exposing it to sale. The washed article is, of course, much paler and cleaner than its original condition, and often sold fradulently as the Europe or foreign variety of mastich. Although the resin of *P. Terebinthus* and of *P. Lentiscus* are identical in many respects, yet they differ greatly in two or three of their most important physical characters, viz., while the latter is invariably hard, brittle, roundish, oblong or ovate, the former is always more or less *soft* and *flat*, as already explained.* There is also some difference betweeen the therapeutic values of these drugs, which is in favor of their Indian or Cabul variety. In all the trials I have made of these medicines, I found the last-named variety more efficacious as a remedy for gonorrhœa and gleet than the true or the Mediterranean variety of mastich obtained through Arabia. The cheapness and abundance of the former in this country are its additional advantages over the latter.

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* I have just received a very good and authentic specimen of mastich from Constantinople, through a Turkish gentleman, Moulvi Sayed Jamaloodeen Sahib Rûmi, who is now in Madras. The larger tears in this specimen being *flat* and more or less *soft*, it quite corresponds with my description of the Cabul variety of mastich, except that it is not opaque, but semi-transparent and much brighter than the latter. The drug from Constantinople is no doubt the best variety of mastich from Scio.—M.S.

With reference to its distinction from the small variety of *Kundur* (*Olibanum or Indian frankincense*), to which it bears a great resemblance, see the "water-test" explained under that article.

† Pistacia integerrima, *Stewart.* 198.

Habitat.—Himalaya.

Part used.—The galls.

Synonyms.—Kákaṛá-singí, Kákṛá-séngì, *Hind.* Kákáṛ-singí, Kákad-singí, *Duk.* Karkata-sringí, *Sans.* Kákkata-ṣhiṇgi, Karkátaka-ṣhiṇgi, *Tam.* Kákara-ṣhingi, *Tel.* Kákada-ṣhiṇgi, *Mah.*

Local Sources.—Not found in Southern India, but could be obtained either from Calcutta or Bombay whenever it is necessary.

Physiological Actions.—Astringent and tonic.

Therapeutic Uses.—As these galls are not sold or met with in South India and requiire to be sent for from very distant places, my personal experience of their therapeutic uses is not extensive. It is, however, sufficient to speak of their astringent action in favorable terms, and they are of great service in cases of chronic diarrhœa, and dysentery, and in passive hæmorrhages. The galls act more satisfactorily in combination with other medicines of similar nature, a formula of which is given in the following paragraph.

Preparations.—Simple and Compound Powders. The simple powder requires no explanation for its preparation, it being reduced to a fine powder in the ordinary way and kept in a closed bottle. Compound powder: Take of the *Galls* of *P. integerrima*, *Terminalia chebula*, and *Pistacia Terebinthus*, and of *Fenugreek-seeds* and *Cinnamon bark*, all in powder and of each five ounces; *Opium*, in powder, one ounce; *Gum Acacia*, in powder, six ounces; and *Prepared Chalk*, eight ounces; mix them well, pass the compound powder through a fine sieve, rub it lightly in a mortar and keep it in a stoppered bottle.

Doses.—Of the simple-powder, from fifteen to thirty grains; and of the Compound-powder, from thirty to sixty grains, every 2nd, 3rd or 4th hour, or after each motion.

European Drugs for which they may be substituted.—Gummi-rubrum, Hæmatoxylum, Krameria, Pul. cretæ aromaticus cum opio, and Pulv. ipecac. compositus.

Remarks.—As already mentioned, *Kákṛá-singí* are not found in the bazaars of South India, but under that name some native druggists deceitfully sell the galls of *Terminalia chebula* or *Gule-halilah* to those who are not acquainted with the drug. The above medicines, however, differ so much from each other that they will not be easily confounded by any person who has ever seen them or is acquainted with their description. I have obtained *Kákṛá-singi* more easily from Calcutta than any other city in India, and according to the size of the drug I received on different occasions, there are apparently two varieties of it, the large and the small. In the large variety the galls are generally about the size and length of the index finger, hollow, thin walled, tapering towards one end

often curved or bent and sometimes contorted. They bear a resemblance to small horns of a goat; hence the word *singi*, *shingi* or *sringi* affixed to all their native synonyms, which means *horny*. The galls are generally brown and possess a strong astringent and slightly bitter taste. The galls in the small variety are about one half smaller than those in the large one, and are generally much darker in color and more astringent in taste. When the Simple and the Compound powders I have described under the head of "*Preparations*" are prepared with the small variety of *Kákṛá-singi*, they have always been found more efficacious and useful in diarrhœa and dysentery than those prepared with the large variety of the same drug; and the former is, therefore, a better drug than the latter. The galls contain about 75 per cent. of tannic acid.

† Rhus coriaria, *Linn.* 199.

Habitat.—Persia and Asia Minor.

Part Used.—The pericarp of the seeds and leaves.

Synonyms.—Gardahe-sumáq or Gardahe-samáq, *Arab.*, *Pers.*, *Hind.* and *Duk.*

Local Sources.—The pericarp or husk of the seeds is sometimes sold separately in the bazaar; but as it is supposed to get spoiled and lose its efficacy by keeping, it is generally separated from the seeds immediately before its use. The seeds under the Arabic name *Sumáq* or *Samáq* are pretty common in all the large bazaars of India.

Price.—Of the seeds—Wholesale, Rs. 4 per maund; retail or bazaar, As. 1½ per pound. Of the pericarp of the seeds—Retail or bazaar, As. 4 per pound.

Physiological Action.—Astringent.

Therapeutic Uses.—Useful in diarrhœa and dysentery, particularly among children. Its efficacy and usefulness is much enhanced when used in combination with other drugs, a formula for which will be found in the following paragraph:—

Preparation.—Compound-powder: Take of the *pericarp* of the seeds of *Rhus coriaria*, *Butea-gum* and the *Gum* of *Odina Wodier*, in powder, each ten drachms; the *fruit* of *Carum Roxburghianum*, in powder, five drachms; *Cinnamon-bark*, in powder, four drachms; and *Opium*, in powder, one drachm; mix them thoroughly, pass the powder through a fine sieve, rub it lightly in a mortar and keep it in a closed bottle.

Dose.—From five to forty grains; regulated according to the age of the patient and the quantity of opium it is desired to administer. Forty grains contain one grain of opium.

European Drugs for which it may be substituted.—Pulv. ipecac. compositus, Pulv. kino compositus, and Pulv. cretæ aromat. cum opio.

Remarks.—The dry fruit of this plant is so small and flat that it looks like a seed. It is either circular or oblong; generally about a line and-a-half in diameter, and half a line in thickness. It is covered with a very thin and light pericarp, which is reddish-brown or rust-colored, odorless, slightly astringent in taste, and can be easily

removed from the seeds by rubbing between the hands. The seeds are about one-half smaller in size, almost always oblong, very hard, slightly inclining to be kidney-shaped and possess no particular taste or smell.

The seeds of *R. coriaria* are much recommended in some Persian and other native medical works in dysentery and diarrhœa, but I have tried them in my practice and found them to be quite inert if employed without their pericarp. The latter alone is astringent, and if administered without the seeds, it produces the desired effect to a greater or less extent. The pericarp as well as the leaves contain tannic acid and coloring matter. Its combination with some stimulant and other astringent drugs, such as those that are mentioned in the prescription under the head of *Preparation*, renders its action much more satisfactory, as already remarked.

† Mangifera indica, *Linn.* 200 and 201.

Habitat.—Cultivated all over India.

Parts Used.—The kernel of the seed, pulp of the fruit and gum.

Synonyms.—Of the kernel—The kernel of mango, *Eng.* Ánb-kí-guṭli-ká-ma*gh*z, *Hind.* Ám-ki-guṭlí-ká-ma*gh*z, *Duk.* Ma*gh*ze-ta*kh*me-anbah, *Pers.* Of the gum—Ánb-kí-gónd, *Hind.* Ám-ká-gónd, *Duk.* Máṇgá-pi*sh*in, *Tam.* Mámiḍi-pisunu, Mámiḍi-banka, *Tel.* Mávva-pa*sh*a, *Malyal.* Mávina-miána, *Can.* Ám-gun, *Beng.* Ámraniryásam or Amra-niryásam, *Sans.* Ambá-cha-gónda, *Mah.* Ambá-nu-gúndar, *Guz.* Amba-melleiyam, *Cing.* Siya-sí, *Bur.* Of the fruit—Mango, *Eng.* Ánb, *Hind.* Ám, *Duk.* Máṇgá-pa*zh*am or Máṇgá-paṛam, *Tam.* Mámíḍi-panḍu, *Tel.* Mávva-káya, *Malyal.* Mávináhaṇṇu, *Can.* Ám, *Beng.* Ámra or Amra, Ámra-phalam, *Sans.* Ambá, *Mah.*, *Guz.* and *Cing.* Siya-ti, *Bur.* Anbaj, *Arab.* Anbah, Na*gh*zak, *Pers.* Of the grafted fruit.—Grafted mango, *Eng.* Paivandí-ánb, *Hind.* Paivandí-ám, Alfan, *Duk.* Vaṭṭu-maṇga-pa*zh*am or Vaṭṭu-máṇga-paṛam, *Tam.* Vaṭṭu-mámiḍi-panḍu *Tel.* Anṭu-mavina-haṇṇu, *Can.*

Local Sources.—In the season of mango fruit, its stones are so common that they are found thrown about everywhere, and can be obtained in large quantities at the cost of gathering. As the kernel gets spoiled if it is allowed to remain in the shell for more than two or three months, it should always be removed as soon as possible, dried in the sun and kept for use. The kernel of young mangoes before the shell is fully developed is a better astringent medicine than that of the ripe fruit.

The gum is sometimes found in the bazaar, or may be collected from the trees which are very abundant in every part of India.

With regard to the fruit itself, the common or ordinary mango is one of the commonest, cheapest, and most abundant fruits in India in its proper season ; but its grafted variety is comparatively rare and dear and found only in cities, towns, and some very large villages.

Physiological Actions.—The kernel is astringent, demulcent, and nutrient ; the gum, demulcent, and slightly stimulant ; the pulp of the ordinary mango, laxative, and that of the grafted variety very nutrient.

Therapeutic Uses.—The kernel of young or half-grown mangoes is very useful in chronic diarrhœa and dysentery, and in hæmatemesis and bleeding piles. In the two first-named diseases it is much more useful if combined with *opium* and some stimulant and aromatic drugs, such as those given in the formula of " Compound powder " under the next heading (*Preparations*). The kernel of ripe mangoes used in a similar manner possesses also some control over the above affections, but to a less extent, it being more nutrient and demulcent than astringent. Roasted or boiled, this kernel is not unpleasant to taste, and is used as food by the poorer classes in times of scarcity and famine. The gum is an ingredient in the formula just alluded to.

The pulp of the ordinary mangoes generally acts upon the bowels, but it is never resorted to for that purpose as a medicine; and the pulp of their grafted variety is very nutritious. I am acquainted myself with some persons, who get stouter by eating some of the varieties of grafted mangoes regularly every day during the season of those fruits.

Preparations.—For reasons already explained, the seed should be removed from young or half-grown mangoes in their fresh state and cut into small pieces and dried in the sun immediately. In the case of ripe mangoes, the seed or kernel must also be separated from the shell as soon as possible, and if not already dry, it should be dried in the sun in the same manner. The preparations of the kernel are Simple and Compound powders. Simple powder: The kernel should be reduced to powder in the ordinary way and kept in a closed vessel. Compound powder: Take of the *kernel* of young or half-grown *mangoes*, in powder, three ounces; *Cuminum cyminum*, *Piper nigrum*, *Zingiber officinale*, in powder, each one ounce and two drachms; the *gum* of *Mangifera indica*, in powder, five drachms; *opium*, in powder, one drachm; mix them thoroughly, pass the powder through a fine sieve, rub lightly in a mortar, and keep it in a closed bottle.

Doses.—Of the Simple powder, from forty to eighty grains; and of the Compound powder, from ten to sixty grains, according to the age and other circumstances of each individual case, three or four times in the twenty-four hours. There is one grain of *opium* in every drachm of the Compound powder.

European Drugs for which they may be substituted.—The Simple powder, for Creta præparata and Pulv. cretæ aromat.; and the Compound powder, for Pulv. ipecac. compositus, Pulv. kino compositus, and Pulv. cretæ aromat. cum opio.

Remarks.—The mango is too common and too well known in India to require any particular description. It is a drupe, and one of the best and most tasteful fruits in India. It varies a great deal in its size, being sometimes as small as a large walnut and at others as big as a child's head. It is generally about the size of a man's fist. It also varies much in its shape, but is generally ovoid, or oval with the lower end smaller and longer than the other and bent to one side. The seed or stone is compressed, oblong, or slightly kidney shaped, very fibrous and tough; varies in length from $1\frac{1}{2}$ to $2\frac{1}{2}$ and in breadth from 1 to $1\frac{1}{2}$ inches. When very dry, the kernel is found loose and movable in the shell. The kernel is invariably and perfectly kidney-shaped; when dry, it is very hard, grey or brown, varies in length

from 1½ to 2, and in breadth from 1 to 1½ inches; when fresh, it is about one-third longer and broader, white and soft. The taste of the kernel is slightly astringent and demulcent, and it possesses no particular smell. When the kernel of young mangoes is cut with a knife, a blue stain is left on both the instrument and the drug, indicating the existence of a large quantity of tannic acid in the latter. The gum of mango tree occurs in small and irregular masses, some of which consist of very small tears sticking to each other. The gum is generally reddish-yellow or reddish-brown in color, with a bland mucilaginous taste.

During the great famine of 1877 and 1878 in Southern India, I heard from many famine-stricken persons sent from villages to the "Relief-houses" at Madras that, if the kernel of mango is fresh and roasted or boiled it is not unpleasant to taste, and is more nutritious than the pulp of that fruit in an equal quantity. This statement may be correct as far as the ordinary and sour mangoes are concerned, but will not hold true in the case of grafted mangoes. As a rule the pulp of the latter is much more delicious, nutritious, smooth and wholesome than that of the common or ordinary mangoes. Of the many varieties of grafted mangoes in Southern India, there are five which justly enjoy the highest repute for their good and pleasant taste, wholesomeness and nutritious quality, and are readily recognised under the Hindustani or Dukhni names of *Qádar-pasand*, *Mulgḥóbá*, *Pítar-pasand*, *Dil-pasand* and *Yáqúte-rummáni*. Of all these varieties, again, the first-named (*Qádar-pasand*) is the best.

As already explained under the headings of "*Preparations*" and "*Therapeutic uses*," the kernel of young mangoes is a good astringent and possesses a considerable influence in diarrhœa, dysentery, and a few other diseases, especially in the form of compound-powder. I do not, however, think that it is in any of its stages bestowed with an anthelmintic property, which is assigned to it in some native and other medical works. I have used it in many cases in no less than from one to two drachm doses, and never found it to expel a single round or any other abdominal worm, while on the other hand, a few small doses of *santonin* in five or six of the same patients, brought out more or less lumbrici without exception.

† Anacardium occidentale, *Linn.* 202, 203 and 204.

Habitat.—Found on sandy soil along the coast, and also cultivated in some gardens.

Parts Used.—The fruit (**No. 202**), oil (**No. 203**) and gum (**No. 204**).

Synonyms.—Of the fruit—which is commonly known as nut—Cashew-nut, *Eng.* Kájú-kí guṭlí, *Hind.* and *Duk.* Mundiri-koṭṭai, Koṭṭai-mundiri, *Tam.* Jíḍi-mámidi-vittu, Munta-mámiḍi-vittu, *Tel.* Paranki-máva-kuru, Kappal-*ché*ran-kuru, Kappa-máva-kuru, *Malyal*, Géra-poppu, *Can.* Hijli-bádám, *Beng.* Kájú-cha-bí, Kaju-cha-anthóli, *Mah.* Kájú-nu-góṭli, *Guz.* Kaju-aṭṭa, *Cing.* Ṣihosaye-zi or Tihotiya-zi, *Bur.* Of the oil—Cashew-nut oil, *Eng.* Kájú-ká-tél, *Hind.* and *Duk.* Mundiri-eṇṇey, *Tam.* Jiḍi-mámiḍi-núne, Munta-mámiḍi-núne, *Tel.*

Paranki-máva-eṇṇa, Kappa-máva-eṇṇa, *Malyal.* Géra-poppu-yaṇṇe, *Can.* Hijli-bádám-tail, *Beng.* Kájú-cha-téla, *Mah.* Kájú-nu-tel, *Guz.* Kaju-tel, *Cing.* Ṣihosaye-ṣí or Tihotiya-ṣí, *Bur.* Of the gum—Cashew-nut gum, *Eng.* Kájú-kí-gónd, *Hind.* Kájú-ké-gónd, *Duk.* Mundri-pis*h*in, *Tam.* Jíḍi-mámidi-pisunu, Munta-mámidi-banka, *Tel.* Paranki-máva-pa*sh*a, Kappal-chéran-pa*ṣh*a, Kappa-máva-pa*ṣh*a, *Malyal.* Géra-míána, *Can.* Hijli-bádám-gun, *Beng.* Kájú-cha-gónda, *Mah.* Kájú-nu-gún, *Guz.* Kaju-melliyam, *Cing.* Ṣihosaye-si or Tihotiya-si, *Bur.*

Local Sources.—The fruit of this plant is met with in the bazaar only in its proper season, but the seed or kernel is always sold by the sweet-meat makers. The oil can be obtained readily by expression, and the gum requires to be collected from the trees.

Prices.—Of the kernel—Wholesale, Rs. 2½ per maund; retail or bazaar, As. 2 per pound. The price of the kernel freed from the testa or skin is one anna more to each pound.

Physiological Actions.—The kernel is nutritive, demulcent and emollient; the oil emollient.

Therapeutic Uses.—In the form of mixture, the kernel is useful for all the purposes for which the Mistura amygdalæ is employed, and also as a food in very weak patients suffering from incessant and chronic vomiting, with two or three minims of Acid. Hydrocyanic. Dil. in each dose. The oil is a mechanical as well as a chemical antidote for irritant poisons. It not only protects to some extent the lining membrane of the stomach and bowels from the irritation of the poison and prevents both the solution and absorption of it, but also neutralizes it by forming a soap with it, if it happens to be an alkaline. It is also a good vehicle for liniments and other external applications.

Preparations.—Of the kernel—Compound-powder and Mixture. Compound-powder: Take of the kernel freed from the testa or skin, eight ounces, rub it in a mortar to a smooth consistence, add gradually four ounces of refined sugar in powder, and one ounce of gum acacia in powder; rub and mix the whole and keep the powder in a lightly-covered jar. The Compound-powder is used for the extemporaneous preparation of the Mixture, which is prepared thus—Rub in a mortar two ounces and-a-half of the Compound-powder with a little water into a thin paste, then add gradually sufficient water to make a pint of the mixture and strain through muslin.

Dose.—Of the Mixture, from one to two fluid ounces, as often as it is necessary.

European Drugs for which they may be substituted.—The Mixture, for Mistura amygdalæ; the Compound-powder, for Pulvis Amygdalæ Compositus; and the oil, for almond and olive oils.

Remarks.—The fruit of this plant looks like a nut and is attached to a fleshy and fruit-like torus, and therefore, in familiar and common language the former is called a nut (Cashew-nut, Kájú-kí-guṭlí, Mundiri-koṭṭai, &c.), and the latter is known as a fruit (Kájú, Mundiri-pa*zh*am, &c.). The fruit is hard, kidney-shaped, ash-colored and about 1 or 1¼ inches long. The pericarp is hard, cellular and contains between its laminæ some acrid oil, and can be easily separated from the seed by breaking. The seed is of the same shape as the fruit,

but somewhat smaller in size than the latter, and is covered with a thin, membranous and rust-colored testa, which can be readily removed by rubbing with the fingers, particularly when it is dried in the sun. The kernel is white, soft, tasteful and wholesome, and abounds in a bland fixed oil, which it yields on expression.

† Semecarpus Anacardium, *Linn.* 205.

Habitat.—Dry jungles.

Parts Used.—The fruit and its acrid oil.

Synonyms.—Of the fruit, which is commonly known as nut—Marking-nut, *Eng.* Bhélá, Bhilá-váṅ, *Hind.* Bhiláváṅ, Biblá, *Duk.* Ṣhéṇ-koṭṭai, Ṣhéráṇ-koṭṭai, *Tam.* Jiḍi-vittulu, Tummeda-mámiḍi, Bhallátamu, Bhallátaki, *Tel.* Chérunkuru, Ténprákkao, *Malyal.* Gérú, *Can.* Bhélá, Bhélvá, *Beng.* Bhallátaki-bijam, Bhallátaka, Arushkara, *Sans.* Bibá, *Mah.* Bhilámu, *Guz.* Ṣhéṇ-koṭṭe, *Cing.* Khi-si, *Bur.* Inqardiyá, Habbul-qalb, Ḥabbul-fahm, *Arab.* Biládur, *Pers.* Of the acrid oil—Bhilávéṅ-ká-tel, *Hind.* and *Duk.* Ṣhéṇ-koṭṭa-eṇṇey, *Tam.* Jíḍi-vittulu-núne, *Tel.*

Local Sources.—One of the commonest drugs in India.

Price.—Wholesale, Rs. 2 per maund; retail or bazaar, Anna 1 per pound.

Physiological Actions.—Internally, sedative, antispasmodic, nervine and alterative tonic; externally, stimulant, rubefacient and vesicant.

Therapeutic Uses.—I have used the black, thick and acrid oil of the marking-nut, prepared either by expression or with the aid of heat, or, the nut itself in the form of Electuary, pretty extensively in my practice and found it so efficacious in acute rheumatism that it may be considered a specific in that disease. I shall speak more on this point under the heading of "*Remarks.*" The drug is also of great service in asthma, and more or less beneficial in secondary syphilis, hæmorrhoids, neuralgia, epilepsy, anæsthesia, paralysis, lepra, psoriasis and a few other cutaneous affections. Externally, the oil is a very cheap and pretty useful counter-irritant, but requires great care and caution in its employment. It should not be applied much or continuously to any part, but always in the form of parallel lines by means of a long needle or wire. In very severe cases these lines may be crossed with other parallel lines in an opposite direction. In either case, when the blister is risen, it should be pricked and the serum allowed to dribble away, and then the use of poultices for two or three days renders the part very clean and fit to be dressed with simple dressing, carron oil or plantain leaves. The nut is more useful in hæmorrhoids in the form of fumigation than the internal administration of its oil or electuary; but, unfortunately, its smoke is attended with bad effects in some constitutions. Out of the two severe and painful cases of piles I treated with fumigation, one suffered from a swelling on the face, chest and abdomen with an erysipelatous blush, while the other was quite free from all those symptoms. Both, however, were much benefited by the remedy in one sitting. Although I have not seen any case of bad effects from internal use of the marking-nut, there is no doubt that it is an irritant poison in a large quantity or overdose.

Preparations.—Numerous preparations of the marking-nut are described in some Persian and Arabic medical works, and the part of the drug which enters into most of them is the thick, black and acrid oil found in the cellular portion of its pericarp. This oil is spoken of in the above medical works as *Asle-biládur* or honey of the marking-nut, and its Hindustani name is *Bhiláréń-ká-tél*, which simply means the oil of the marking-nut. It is generally prepared by the native practitioners in this part of India by the aid of heat. The nuts being slightly cut or broken at each of their ends, they are put in an earthen pot, the bottom of which is perforated by 3 or 4 small holes. The pot's mouth, well closed with an earthen plate, is placed over another and smaller vessel and luted together, and then placed in a pit about 2½ feet deep and nearly as wide, with a smaller pit at its bottom just sufficient to hold the smaller vessel. The pot is finally surrounded with cakes of dry cow-dung, which are set on fire till they are consumed. On removing the vessels when cool, the smaller one at the bottom will be found to contain a thick, black, very acrid and smoky oil in proportion to the quantity of the nuts used in the process. The oil is to be strained through thin muslin if it is intended for internal use.

I have, however, succeeded in preparing this oil very easily by compression, and the oil thus prepared is more pure and quite free from smoke. The ordinary screw-press, which is generally known as the "Tincture-press," is well suited for this purpose, and I have used it in the following manner:—Divide each marking-nut into 4 pieces by a sharp chisel and put them in sufficient quantity in the perforated holder of the press; subject the drug now to pressure as much as possible by working the screw in the usual way, and the oil will begin to flow in a small stream or continuous drops through the small tube at the bottom of the machine. It will be better to remove the kernel from the pieces, but the little handling which is necessary for this purpose gives rise to injurious results. The persons engaged in removing the kernel frequently suffer from a swelling on the arms, face and legs. The swelling on the face is generally accompanied by an erysipelatous blush, and that on the extremities by a miliary eruption. In some severe cases the swelling lasts for more than 8 or 10 days, and terminates by desquamation of the cuticle. Owing to these bad results, I generally prepare the oil without removing the kernel, and even then the hands, forearms and face of the persons who are engaged in the process should be smeared with cocoanut, jinjili or some other fixed oil. I have always used this oil very easily and safely in the form of a draught with mucilage and sugar.

Many Hindu medical practitioners in this country never resort to the oil of the marking-nut for internal purposes, but employ the nut itself, and before doing this, they boil it in cowdung and wash it afterwards with cold water. This process is, in my opinion, as nasty as it is unnecessary. After many trials, I have found the above oil and an Electuary of the nut to be the best and most convenient forms for internal use. The Electuary is prepared as follows:—Take, by weight, one part of the marking-nut; six parts of the kernel of cashew-nut without the testa or skin, in coarse powder; and one part of clarified-honey; bruise and rub well separately the marking-nut in a stone mortar, add gradually the cashew-nut powder and the honey, and rub

them all into a uniform mass. When bruised separately, the marking-nut is very viscid and sticks to the mortar and fingers, but when it is well rubbed and mixed with the other ingredients, it is formed into a soft and unctuous mass, which does not stick to anything. So, this Electuary is a very convenient preparation for handling, weighing and administering internally, and it also keeps well for a long time. The precaution of smearing the hands, &c., with oil should also be observed in preparing the Electuary, for its omission in one case gave rise to one of the bad effects described above.

Doses.—Of the acrid oil, from sixty to one hundred and fifty minims; and of the Electuary, from sixty to one hundred and fifty grains.

European Drugs for which they may be substituted.—Internally, for Salicylate of Soda, Salicylic acid, Colchicum, Ether, Belladonna, Iodide of Potassium, Perchloride of mercury, Aconite root, Valerianate of zinc, and Strychnia; and externally, for Cantharides.

Remarks.—Like cashew-nut, the marking-nut is a fruit and not a seed or nut as its name implies; but it is commonly known as a nut in contradistinction to the fleshy torus, to which it is attached, and which is considered by the natives of this country as a fruit of *S. Anacardium.* The marking-nut bears a resemblance to the heart, particularly when it is fresh and attached to the torus; hence its Arabic synonym *Habbul-qalp* or the *heart-nut.* As sold in the bazaar, the marking-nut is about 1 inch long, $\frac{3}{4}$ inch broad at the upper end, and very narrow at the lower; compressed or flat on both sides, dark-down, smooth and shining. On breaking the nut, the pericarp will be found to contain an oily juice, which is very black and of a thicker consistence than honey, viscid, and leaves a permanent black mark on cotton-cloths. Owing to its last-named character the juice is in use for marking cotton cloths all over India, and the fruit producing it is therefore called *the marking-nut* in English. The taste of the oily juice is very acrid and unpleasant, with a slight but peculiar smell. In addition to this, both the taste and smell are smoky if the oil is prepared by the aid of heat, as mentioned elsewhere. It is readily and perfectly soluble in ether and chloroform, soluble in alcohol, and partially so in turpentine; miscible but not soluble in fixed oils. It leaves an oily stain on paper, and a wick dipped into it burns with a good flame like one dipped into any fixed oil.

The number of the preparations described in some Persian and Arabic medical works, in which the viscid black oil of the marking-nut (*Asle-biládur*), or the nut itself, is a chief ingredient, and which are consequently named after the Persian synonym of the drug, as *Javárish-e-biládur* (electuary of the marking-nut), *Halváe-biládur* (confection of the marking-nut), &c., is more than 40! Most of these preparations, again, contain more than 20 ingredients, and some not less than 35, in each! This is quite sufficient to prove the great esteem in which the marking-nut is held as a therapeutic agent by the Muhammadan medical practitioners in India, Persia and Arabia. These remarks, however, are applicable only to the internal use of the nut, and I do not hesitate in adding that out of the many cases in which I employed it or its oil in full medicinal doses, there was not a single instance of complaint of irritation of the alimentary canal or of

any other bad effect; but, with regard to the external use of the drug, a mere handling of it during the preparation of its oil, &c., or exposure to its smoke is often attended with injurious results as already explained under the heading of "*Preparations.*" Some care and caution, however, such as those I have mentioned under the same heading, are sufficient to prevent the injurious effects of the marking-nut in preparing its oil and electuary, and this is a very important circumstance in favor of not giving up the employment of so useful, active and effectual an internal remedy as the drug under discussion.

Marking-nut is one of the few drugs which I have found more or less useful in all the diseases for which it is recommended in native and other medical works. These works, however, speak of the usefulness of the drug in rheumatism in a very casual manner and only as a local application; but according to my own experience it is, as an internal remedy, so useful in the *acute* form of that disease that it deserves a special attention. Used in full and repeated medicinal doses, the relief it affords is very great and satisfactory, and I do not hesitate in calling it a sovereign remedy in *acute rheumatism*. It is certainly more sure and speedy in its action than Salicylic acid, Salicylate of Soda, Colchicum, &c., and therefore the best drug for the above complaint. The more recent and acute the disease is, the more speedy and successful this medicine proves. Many of the patients suffering from acute rheumatism, who were brought to me in doolies or other vehicles, and who were quite unable to sit or move without assistance, were able from the use of the Electuary or the Acrid-oil of this drug to return to me walking on the 6th or 7th day after their first visit. On a few occasions, again, I was pleasantly surprised to see them walking lamely and coming to me on the very next or 3rd morning to say that they were much better. In the latter case, the patients were all youths or very young men.

With regard to the preparations of the marking-nut I have described (Electuary and Acrid oil), there is no difference between the therapeutic uses of them, particularly in the treatment of acute rheumatism; but the patients generally prefer the former on account of its very pleasant taste. The number of the doses of these preparations I have generally used in the 24 hours is 4, and the dose of both is the same, viz., from one and a half drachms to two drachms and a half. In some very severe cases, when the patients were very strong and robust, the dose was increased to three drachms, but the average dose is two drachms, which is the one I have most frequently employed in my practice. As soon as the patients are much relieved and able to walk about to some extent without assistance, I generally omit the drug and complete the cure with milder or less active medicines, such as Salicylate of Soda, Colchicum, alkalines, and with stimulant embrocations.

In chronic and muscular forms of rheumatism, however, the marking-nut is not half as useful as it is in its acute variety, and I am therefore unable to speak much in its favor in the treatment of the former diseases.

Marking-nut is also a good therapeutic agent in asthma, but the relief it affords in so small doses as those mentioned in some books is

very slight. To secure its best effects in this disease, it should be used repeatedly and in doses similar to those I generally employ in acute rheumatism. Gout is so rare among the natives of this country that I never had an opportunity of using this drug in any well-marked case of that disease during the last two years; but from its great influence over acute rheumatism I am almost sure that it will also produce good results in the acute form of the former.

There is a notion among the natives of Southern India that the internal use of the marking-nut is apt to produce sore-mouth or ptyalism; but I have never met with a single instance of these bad effects, though I have administered the drug in many cases and in so large and repeated doses as those explained above.

During the employment of the marking-nut, either externally or internally, the least appearance of a rash or redness of the skin, or an itchy or uneasy sensation in any part of the body, should be considered as a sign of the bad effects of the drug, and it should, therefore, be stopped immediately. Spiritus Ammoniæ Aromaticus is to be freely administered, with some demulcent drinks, such as Infusum Lini, and some oil, Olive or cocoanut, should be constantly smeared over the affected part or parts. This is generally sufficient to check the above symptoms; but if they get worse and become more developed, they must be treated with some other and stronger remedies according to their nature.

‡ Buchanania latifolia, *Roxb.* 206.

Habitat.—Mountains on the Coromandel and Malabar coasts; Cuddapah, Belgaum and Mysore forests.

Parts Used.—The seed or kernel and oil.

Synonyms.—Of the seed or kernel—The Cuddapah almond, *Eng.* Chirónjí, Chárólí, *Hind.* Chár-kí-charolí, Piyál-cháróli, Piyár-cháróli. *Duk.* Kátmá-pazham-parpu or Kátmá-pavam-parpu, Shára-parpu, *Tam.* Chára-pappu, Cháru-mámiḍi-pappu, Járu-mámidi-pappu, *Tel.* Kátmáva-parpu, *Malyal.* Chára-pappu, *Can.* Piyál, *Beng.* Piyála, *Sans.* Chirunji, *Mah.* and *Guz.* Lonenpho, Lamboban, *Bur.* Of the oil—The Cuddapah almond oil, *Eng.* Chírónji-ká-tél, Cháróli-ká-tél, *Hind.* and *Duk.* Kátmá-payam-enney, Kátmánga-parpu-enney, *Tam.* Chára-pappu-núne, *Tel.* Píyál-tail, *Beng.*

Local Sources.—The seeds are sold in the local market, but the oil requires to be prepared by expression. The seeds are imported every year to Madras in pretty large quantities from Cuddapah.

Price.—Of the seeds. It fluctuates a great deal and varies from As. 4 to 12 per pound.

Physiological Actions, Therapeutic Uses, Preparations, Doses, and European Drugs for which it may be substituted.—My remarks under these headings are precisely the same as those under the corresponding headings in the article "*Anacardium occidentale.*"

Remarks.—The seeds are about 2 lines long and 1½ broad; oblong, oval or roundish generally, and slightly compressed on both sides, and

covered with a thin and rust-colored testa. The kernel is pale-white and contains more than half its own weight of oil. The seeds are very tasteful, wholesome and nutritive, and yield on expression a bland fixed oil, the physical and medical properties of which are similar to those of the *Cashew-nut oil.*

† Odina Wodier, *Roxb.* 207, 208 and 209.

Habitat.—Pretty common in Southern India, especially in the city of Madras.

Parts Used.—The gum and bark.

Synonyms.—Of the gum—Jinkin-kí-gónd, Kinné-kí-gónd, *Hind.* Bésharam-ké-jhár-ká-gónd, Shimpṭí-gónd, Múyí-gónd, *Duk.* Odiya-pi*sh*iṇ, Annaikiri-pi*sh*in, *Tam.* Oddi-pisunu, Dampara-pisunu, *Tel.* Udi-pa*sh*a, *Malyal.* Jival-lásá, *Beng.* Jingini-niryásam, *Sans.* Shimpṭí-gónda, *Mah.* *Of the bark.*—Jin-kín-ki-*chh*ál, *Hind.* Bésharam-ké-jhar-kí-*chh*ál, *Duk.* Odiya-pattai, Odiy-maram-pattai, *Tam.* Oddi-paṭta, Oddi-cheṭṭu-paṭṭa, *Tel.* Udi-tóla, Udi-maram-tóla, *Malyal.*

Local Sources.—Not sold in the bazaar, but as the plant is found everywhere in Madras the bark can be obtained whenever it is needed, and the gum requires to be also collected in its proper season.

Physiological Actions.—The gum is demulcent, and the bark astringent and tonic.

Therapeutic Uses.—The gum is an ingredient in one of the prescriptions I often use with success in infantile diarrhœa. See **No. 199.** A decoction of the bark is useful as a gargle in sore-mouth and ulceration of gums, and as a lotion in some forms of ulceration and eruption, as mentioned in some medical works. It is also useful internally in some cases of atonic dyspepsia and general debility, particularly if it is combined with the Tincture of Gentian, Calumba, &c. The decoction, however, does not produce any distinctly good effect either as an internal or external remedy unless it is very strong, such as the one described in the next paragraph.

Preparation.—Decoction: Take of the inner bark, in coarse powder, five ounces; water, three pints; boil on a slow fire till the liquid is reduced to one pint, cool and strain.

Dose.—From one and a half to three fluid ounces, 3 or 4 times in the 24 hours.

European Drugs for which they may be substituted.—The bark for Tinctura Myrrhæ, Liquor Plumbi Sub-acetatis Dilutus, Alum, Gentian and Calumba; and the gum for Gum-Acacia.

Remarks.—Generally the gum occurs in tears, which are either yellowish or reddish brown and semi-transparent, or, colorless and transparent. While this is generally the case, I have seen on two occasions about a month after the rainy seasons a large quantity of gum and resinous substance exuding from a large and old wound on the stem of a very large and old tree, and collecting on the ground in the form of an oblong and irregular mass. Two-thirds of this mass consisted of gum, which was nearly colorless or pale-white, and one-third of insoluble

substance which was brown or dark-brown. The latter was just behind the layer of the gum and in contact with the tree and ground. If left in water the gum of this tree slightly swells and is formed into a kind of soft jelly, and is miscible but not completely soluble in water.

The bark of the younger plants is ash-colored and not rough externally and very fibrous and of a flesh color internally; and that of the older trees is very rough, scaly, generally about $\frac{3}{4}$ of an inch in thickness, brown externally, and reddish-brown internally. The taste of the inner bark is slightly astringent, due to tannic acid.

‡ Spondias mangifera, *Pers.* 210 and 211.

Habitat.—Found growing in many gardens in the city of Madras.

Parts Used.—The young fruit (**No. 210**) and gum (**No. 211**).

Synonyms.—Of the fruit—The hog-plum, Wild mango, *Eng.* Amrá, *Hind.* Janglí-ám, Maryam-ká-phal, *Duk.* Mari-máṇga or Marya-mánga, Káṭṭu-mávga, *Tam.* Ivura-mámiḍi, Aḍavi-mámiḍi, *Tel.* Ambalam, Anpázhaṁ or Ampáṛam, *Malyal.* Káḍu-máviná, Amṭe, Aṃṭe-haṇṇu, *Can.* Ámrá, *Beng.* Ámrátaka, *Sans.* Of the gum—Ámré-kí-gond, *Hind.* Maryam-ké-jhár-ká-gónd, janglí-ám-ká-gónd, *Duk.* Marimánga-piṣhin, *Tam.* Ivura-mámiḍi-pisunu, *Tel.*

Local Sources.—Neither the fruit nor the gum is sold in the bazaar, but they both require to be gathered in their proper season.

Physiological Actions.—The young fruit is stomachic and tonic, and the gum demulcent and emollient.

Therapeutic Uses.—The young fruit in powder is, as a stomachic, useful in some slight cases of atonic dyspepsia; and as a tonic, in all the affections in which Gentian and Calumba are indicated. The gum in the form of mucilage is a useful adjunct to other medicines for the purpose of suspending heavy powders, &c.

Preparation.—Simple powder: Select the young fruits before their nut is hard and fully developed, remove the nut, cut the fleshy portion into small pieces and dry them in the sun; when quite dry reduce them to a fine powder in the usual manner.

Dose.—From thirty grains to one drachm or more, 3 or 4 times in the 24 hours.

European Drugs for which they may be substituted.—The young fruit for Gentian and Calumba, and the gum for the Indian Gum-arabic.

Remarks.—The fruit is a fleshy drupe, oval, varying in length from 1 to $1\frac{1}{2}$ inches, and in thickness from $\frac{3}{4}$ to $1\frac{1}{4}$ inches, smooth, green when young and yellowish when ripe, subacid and astringent in taste with a slight and peculiar smell. It bears a resemblance to a very young and small mango; hence it is known in some languages as a "wild mango."

S. mangifera is one of those plants which, when very large and old, throws out occasionally a large quantity of gum with some resinous substance through an old wound or crack. The gum and resin thrown out in this manner collect on the ground near the stem of the tree in the form of a thick, flat, oblong or irregular mass. I am myself

aware of three trees of this kind, one of which is not far from my residence. On one occasion, some years ago, I found a large mass of gum and resin on the ground near the stem of this tree, which was more than 6 pounds in weight. About two-thirds of this mass was gum, and the remaining consisted partly of a brown and partly of a dark-brown substance, both of which were more resinous than anything else. In addition to the above occasional flow of gum, a small quantity of it is often found on *S. mangifera*, which generally is in small and transparent tears. This gum is quite soluble in water and resembles the Indian Gum-arabic in many other characters.

MORINGEÆ.

† Moringa pterygosperma, *Gærln.* 212, 213 and 214.

Habitat.—Much cultivated in gardens in Southern India.

Parts Used.—Flowers (**No. 212**), bark (**No. 213**), root-bark (**No. 214**) and root.

Synonyms.—Of the flowers—Horse-radish flowers, Moringa flowers, *Eng.* Sajnah-ké-phúl, Ségvé-ké-phúl, Sahinjan-ké-phúl, *Hind.* Mungé-ké phúl, *Duk.* Murungai-pú, *Tam.* Munaga-puvvu, *Tel.* Muriṇṇa-pú or Muringa-pú, *Malyal.* Nugge-giḍa-huvvu, Nugge-havvu, *Can.* Sójna-phúl, Sajina-phúl, *Guz.* Mungá-cha-phúla, *Mah.* Sobhánjan-pushpam, Sigru-pushpam, *Sans.* Murangá-mal, *Cing.* Dondalon-póén, *Bur.* Of the bark—Horse-radish bark, Moringa bark, *Eng.* Sajnah-ki-*chh*ál, Ségvé-ki-*chh*ál, *Hind.* Mungé-ki-*chh*ál, *Duk.* Murungai-paṭṭai, *Tam.* Munaga-paṭṭa, *Tel.* Muringa-tól, *Malyal.* Nugge-giḍá-paṭṭe, *Can.* Sójna-ṣál, *Beng.* Sigru-valkalam, Sobhánjan-valkalam, *Sans.* Mungá-cha-paṭṭe, Baḍádi-ṣhingá-cha-paṭṭe, *Mah.* Murangá-potta, *Cing.* Dondalon-khav, *Bur.* Of the root-bark—Horse-radish root-bark, Moringa root-bark, *Eng.* Sajnuh-kí-jaṛ-ki-*chh*ál, Ségvé-kí-jaṛ-kí-*chh*ál, *Hind.* Mungé-kí-jaṛ-kí-*chh*ál, *Duk.* Murangai-vér-paṭṭai, *Tam.* Munaga-véru-paṭṭa, *Tel.* Muringa-véra-tól, *Malyal.* Nugge-béru-patte, *Can.* Sójna-múl-ṣál, *Beng.* Sigru-múlam-valkalam, Sobhánjan-múlam-valkalam, *Sans.* Murangá-múl-potta, *Cing.* Of the root—Horse-radish root, Moringa-root, *Eng.* Sajná-kí-jaṛ, Ségvé-kí-jaṛ, *Hind.* Mungé-kí-jaṛ, *Duk.* Murangai-vér, *Tam.* Munuga-véru, *Tel.* Muringa-véra, *Malyal.* Nugge-béru, Nugge-gida-béru, *Can.* Sojná-múl, *Beng.* Sobhánjan-múlam, Sigru-múlam, *Sans.* Mungá-cha-múlé, Baḍádi-shingá-cha-múlé, *Mah.* Murangá-múl, *Cing.* Sajina-jaḍ, *Guz.* Dondalon-mi, *Bur.*

Local Sources.—Not sold in the bazaar, but require to be collected whenever they are in need, the plant being found everywhere.

Physiological Actions.—The fresh root is stimulant, carminative, stomachic and stimulant-diuretic; and the flowers also possess a slight stimulant property. The bark and root-bark, used externally, are rubefacient and vesicant.

Therapeutic Uses.—I have found the root in the form of "Compound Spirit" very useful in fainting, giddiness, nervous debility, spasmodic affections of the bowels, hysteria and flatulence. The flowers are often resorted to as an aphrodisiac by the native medical

practitioners in Southern India, but they have completely failed in my hands, though I have tried them in very large doses. They are at most a slight stimulant, but have not been found useful even as such in any particular disease. Applied externally in the form of a paste, the fresh root-bark and the bark act as a good vesicant and rubefacient. The former is much superior to the latter in this respect.

Preparations.—Of the root—"Compound Spirit of Moringa." In preparing this spirit I have adopted the formula given in the *Bengal Pharmacopœia* and quoted in the *Pharmacopœia of India* (p. 61), but increased its strength by doubling the proportion of the moringa-root, as follows:—Take of the Moringa-root, sliced, twenty ounces; Orange peel, ten ounces; Nutmegs, bruised, two drachms and a half; Proof Spirit, four pints; Water, one pint and a half. Mix and distil four pints.

Doses.—Of the Compound Spirit of Moringa, from one to four fluid drachms.

European Drugs for which they may be substituted.—Internally, the Compound Spirit of Moringa is a good substitute for Spirit. ammon. arom., Tinct. cascarillæ, Tinct. Valerianæ, Tinct. moschi, Tinct. cardamom. comp., and Spirit. armoraciæ comp.; and externally, the root-bark and the bark, particularly the former, is a fair substitute for the mustard flour imported from Europe and for Emplastrum cantharidis.

Remarks.—The fresh root of a large and well-grown Moringa tree varies in its diameter, in the thickest part, from 1 to 4 inches, and in its length, from 1 to 3 feet, tapering gradually towards its end. It is pale and yellowish-white internally and externally, porous, pretty soft, slightly aromatic and disagreeable in smell, and pungent in taste. It is covered with a bark (the root-bark), which has the same color, smell and taste, and is about 1 or 2 lines in thickness. The bark of the trunk is about $\frac{1}{2}$ inch thick, and its taste and smell are similar to those of the root-bark, but somewhat weaker. It is covered with a rough and scaly epidermis, which is generally of a brown or greyish-brown color, and is easily removed. The inner bark is externally of a greenish, yellowish or pale white color, and its color internally is pale or yellowish white.

The Compound Spirit of Moringa is so useful in all the affections I have mentioned above, that it deserves to be brought into general use in all the large Dispensaries and Hospitals.

LEGUMINOSÆ.

* Acacia Arabica, *Willd.* 215, 216, 217, 218 and 219.

Habitat.—One of the commonest trees in Southern India.

Parts Used.—The pods **(No. 215)**, gum **(Nos. 216, 217,** and **218)**, bark **(No. 219)**, and extract.

Synonyms.—Of the pods—Pods of the Babool tree, *Eng.* Babúl-kí-séngríyáṅ, Babúl-kí-séngíyáṅ, Kíkar-kí-séngríyáṅ, Kíkar-kí-séngíyáṅ, *Hind.* Káli kíkar-ké-phallíyáṅ, *Duk.* Qarz̤ Ṣamare-ammu-*gh*iláṅ,

Ṣamare-mu*gh*ílán, *Arab.* Vélam-káygal, Karu-vélam-káygal, Karu-vél-káygal, *Tam.* Nalla-tumma-káyalu, Barbúramu-káyalu, Tummachettu-káyalu, *Tel.* Karu-vélakam-káya, *Malyal.* Kare-jáli-káyi, Karegobbali-káyi, *Can.* Bábúl-sim, Bábla-sim. *Beng.* Kalabábili-cha-phalli Bábli-chakái, *Mah.* Kálo-bával-nu-singo, *Guz.* Of the gum—The Indian gum-arabic, *Eng.* Ṣamag*h*e-aarabí, *Arab.* and *Pers.* Babúlkí-gónd, Kíkar-kí-gónd, *Hind.* Kálí-kíkar-ká-gónd, *Duk.* Vélampi*sh*in, Karu-vélam-pi*sh*in, *Tam.* Nalla-tumma-banka, Tummubanka, Barbúramu-banka, *Tel.* Vélakam-pa*sh*a, Karuvéla-kam-pa*sh*a, *Malyal.* Gobbali-gondu, Karégobbali-góndu, Karé-jalí-góndu, *Can.* Bábúlér-gun, Bábla-gun, Bábúl-gun, *Beng.* Vabbula-niryásam, Vavulaníryasam, Kála-barbúra-niryásam, Barbúra-niryásam, *Sans.* Kálabábili-cha-gónda, Bábli-cha-gónda, *Mah.* Kalo-bával-nu-gúndar, *Guz.* Of the bark—Babool-bark, bark of the Babool tree, *Eng.* Qishrulmu*gh*ílán, *Arab.* Póstedra*kh*te-mu*gh*ílán, *Pers.* Babúl-kí-*chh*ál, Kíkarkí-*chh*ál, *Hind.* Kálí-kíkar-kí-*chh*ál, *Duk.* Vélam-paṭṭai, Karu-vélampaṭṭai, *Tam.* Nalla-tumma-paṭṭa, Tumma-paṭṭa, Barburamu-paṭṭa, *Tel.* Karu-vélakam-tóla, Vélakam-tóla, Karu-vélakam-tóla, *Malyal.* Góbali-paṭṭe, Karé-gobbali-paṭṭe, Karé-jálí-paṭṭe, *Can.* Bábúlér-ṣál, Bábla-ṣál, *Beng.* Vabbula-valkalam, Vavula-valkalam, Barbura-valkalam, Kála-barbúra-valkalam, *Sans.* Kála-bábili-cha-paṭṭa, Bábilicha-paṭṭa, *Mah.* Kálo-bábul-nu-chál, *Guz.* Of the extract—Akákia, *Eng.* Aqáqíyá, *Arab.*, *Pers.* and *Hind.*

Local Sources.—The gum is one of the commonest drugs in India, and the extract imported through Bombay from Arabia and Egypt under the name of *Akakia* or *Aqáqiyá* is often met with in some large markets, but the pods and bark require to be collected. The extract or *Aqáqiyá* can also be prepared from the pods of this species of *Acacia* (*Acacia Arabica*), as I shall shortly explain.

Price.—Of the gum (picked variety)—Wholesale, Rs. 4 per maund; retail or bazaar, As. 3 per pound. Of the extract or *Aqáqiyá* imported from Arabia and Egypt through Bombay, varies from Re. 1 to 5 per pound. The cost of the extract prepared from the pods of this plant is extremely small.

Physiological Actions.—The gum is demulcent, emollient and nutrient; the fresh and young pods dried in the sun, and the Extract of the fresh pods or *Aqáqiyá* are astringent and demulcent; and the bark astringent.

Therapeutic Uses.—*Aqáqiyá* or a Watery Extract of the fresh and young legumes of this plant possesses a beneficial influence over the membrane of the alimentary canal and genito-urinary organs, and is consequently very useful in diarrhœa, dysentery, gonorrhœa, gleet and chronic cystitis. Although the extract is less effectual in checking dysentery and diarrhœa than opium and some of its preparations, yet it is more efficacious in this respect than all other vegetable and mineral astringents when used *alone*. When dysentery or diarrhœa is complicated with dropsy, opium and its preparations are often injurious, because they generally increase the latter affection in the same proportion they check the two former diseases. It is under these circumstances I have found *Akákiyá* more useful and successful in bowel-complaints than opium and all opiates. A simple powder of the

fresh legumes dried in the sun before their seeds are well developed and hard is pretty useful in diarrhœa and dysentery, and its efficacy is much greater if it is combined with some other vegetable astringents, demulcents, stimulants, and with opium, as is the case with the Compound powder of Akakia or Aqáqíyá. A decoction of the bark of this plant, together with that of the *Tamarindus Indica* and a few other trees is frequently resorted to by the natives of this country as a gargle in sore-mouth, and its use has often been attended with success to my own knowledge.

The gum of this plant or the Indian Gum-arabic, in the form of mucilage, is a most common and useful adjunct to other medicines in pulmonary and catarrhal affections, dysentery and diarrhœa, and in irritable states of the genito-urinary organs. It is most frequently resorted to for the purpose of suspending heavy, insoluble or immiscible medicines, such as the preparations of Bismuth, &c. If the mucilage is very thick, it forms one of the best mechanical antidotes in cases of poisoning by irritant substances. It envelopes the particles or pieces of the poison on one hand, and sheaths the membrane of the stomach on the other, and thus protects the latter from the action of the former, at least, to some extent. In slight cases of cough or irritation of the throat the natives of this country, specially the Muhammadans, often relieve themselves by allowing a piece of this gum to dissolve slowly in their mouth. I did this occasionally myself with success. It is, according to my own experiments, more adhesive than all the gums produced in India, and is therefore well suited for the formation of all kinds of lozenges. It is an ingredient in numerous prescriptions described in Persian, Arabic and Hindustani medical works.

Preparations.—Of the gum—Mucilage: Put four ounces of the gum, in small pieces, with six ounces of cold water into a bottle or earthen jar; stir them frequently until the gum is dissolved, and strain the solution through muslin, if necessary. A thicker mucilage for special purposes is prepared as follows:—Take of the gum in powder, four ounces; water four fluid ounces. Put the gum in a mortar and rub it first with a small quantity of water; then continue rubbing and adding the water very gradually till the mucilage assumes a white jelly-like appearance. Of the pods—Simple and Compound Powders, and a Watery Extract or *Aqáqiyá*. Simple-powder: Select the young and fresh legumes before their seeds are hard and well developed, dry them in the sun and reduce to a fine powder in the usual way, Compound-powder: Take of the Simple-powder, just described, two ounces; the *gum* of *Butea frondosa*, *Betel-nut Catechu* (*Areca Catechu*), in powder, each five drachms; *Ginger*, in powder, three drachms; *fruit* of *Carum Carui* and of *Dill-seeds* (fruit of *Peucedanum graveolens*), in powder, each two drachms; *Opium*, in powder, one drachm and twenty-two grains; and *Gum acacia* or the Indian gum-arabic, in powder six ounces. Mix all the ingredients thoroughly, pass the powder through a fine sieve, rub and mix it well in a mortar, and keep it in a stoppered bottle. *Aqáqiyá* or the Watery Extract: Take of the young and fresh legumes of this plant (*Acacia Arabica*) before their seeds become hard and well developed, rub and bruise them with water in a stone mortar, strain the solution through muslin or thin cloth, and dry it in the sun

or on a sand-bath. Of the bark—Compound Decoction: Take of the inner bark of *Acacia Arabica*, *Tamarindus Indica*, *Albizzia Lebbek*, *Cassia auriculata*, *Ficus glomerata*, and *Odina Wodier*, cut into small pieces, each five ounces; *water* ten pints; boil on a slow fire till the liquid is reduced to four pints, and strain when cool.

Doses.—Of the Mucilage, from four to eight fluid ounces in the 24 hours, or *ad libitum*. Of the Simple-powder, from forty to eighty grains; and of the Compound-powder, from thirty to sixty grains; 3 or 4 times in the 24 hours. Of the Extract or *Aqáqiyá*, from twenty to sixty grains, 3 or 4 times in the 24 hours.

European Drugs for which they may be substituted.—The Mucilage of the picked variety of this gum, for the same preparation of the true Gum-arabic imported from Europe; the Simple and the Compound Powders, for Pulvis Cretæ Aromaticus, Pulv. Cretæ Aromaticus cum Opio, Pulvis Catechu Co. and Pulvis Kino Co.; and the Extract or *Aqáqiyá* for Logwood and its extract, Rhatany and its extract, Catechu, Kino, Botany Bay Kino, Pulvis Ipecacuanhæ Co. and Pulvis Opii Co.; and the Compound Decoction, for the Tincture of Myrrh.

Remarks.—As far as my knowledge extends, the gum produced by *A. Arabica* (the Indian Gum-arabic) is the cheapest and most abundant of all the gums in India, and its picked variety can be used as a very good substitute for the true Gum-arabic imported from Europe. Although it generally consists of a mixture of tears and lumps which differ a great deal in their appearance and vary from a perfect clearness and colorlessness to a yellowish, reddish, dusky or deep brown color, yet the best portion of it bears the greatest resemblance to, forms a very good substitute for, and is quite identical in its medicinal and chemical properties with, the real variety of the drug. The best or picked variety of the Indian Gum-arabic occurs in tears and lumps of various sizes from that of a small walnut downwards. The tears and lumps are generally roundish, ovoid or oblong; occasionally vermicular or irregular; and rarely stalactiform. They are always smooth, shining and more or less transparent, except when they are covered with dust or contaminated with bark, sand or other accidental impurities. When quite dry the tears are brittle, break with a vitreous fracture, bland and mucilaginous in taste. This gum is very soluble in water, but insoluble in alcohol, ether and chloroform. A watery solution of it forms an opaque white jelly with subacetate of lead. The powder of it does not become blue on the addition of an aqueous solution of Iodine.

Aqáqiyá is a watery extract of the fresh-pods of *Acacia vera*, *A. nilotica* and several other species of *Acacia* which yield the Gum-arabic of commerce. It is supposed to be prepared in some parts of Egypt and Arabia and imported to Bombay, and the latter is the source of its supply to Madras and many other places in India. I have tried and succeeded in preparing *Aqáqiyá* from the fresh legumes of *Acacia Arabica* as already described under the heading of "*Preparations.*" The drug prepared by me, which may be called the Indian variety of *Aqáqiyá*, is very superior, as a medicine, to all the foreign or imported varieties, apparently from its being new and pure, while the latter are generally very old and more or less contaminated with accidental or intentional impurities. It is also much cheaper as I shall presently explain.

As there are several varieties of *Aqáqiyá*, they may, for the sake of convenience in describing them, be first divided into a *soft* and a *hard* variety, and then each of the latter into two or more sub-varieties. The drug prepared from the pods of *Acacia Arabica* is a very good example of the soft variety of *Aqáqiyá*. When new, it is pretty soft, could be made into pills and bolusses very easily. Though it gets harder by keeping, yet not to such an extent as to be reduced to a fine powder. It is dark brown in color, very astringent in taste, and possesses a slight and peculiar odour. The only another soft variety of *Aqáqiyá* I have seen is the one which was presented to me some time ago by a Hakeem at Madras. It bore a great resemblance to the above variety, but differed from it distinctly in one or two points. It was *reddish* instead of *deep* brown in color, and more demulcent than astringent in taste. The Hakeem said that he had bought it from a wholesale druggist at Black Town, and the latter seems to have obtained it from Bombay. It is the dearest variety I have seen, its price being about Rs. 5 per pound.

Two kinds of *Aqáqiyá* are generally met with in the bazaars of Madras, and both of these are hard varieties and easily reduced to a fine powder. The first or the best of them is reddish brown with a demulcent and slightly astringent taste, and the second possesses the same taste, but is dusky brown in color. Their price is about Rs. 2½ and 1½ per pound, respectively. I myself obtained *Aqáqiyá* twice from Bombay, and the drug was hard and pulverizable on both occasions. It was identical with the first variety I have just described; except this that on one occasion the medicine was full of minute particles of a dry leaf, which were seen in every part of it. The original cost of each of these varieties was about Rs. 2 per pound.

I have just succeeded in finding that all the hard varieties are either impure or not at all made from the pods of any species of *Acacia*. For example the first or best hard variety I have described above corresponds in many respects with a watery extract prepared from the fresh legumes of *Acacia Arabica* with an equal proportion of Gum-arabic; and the second hard variety is identical in its physical and medicinal properties with a watery extract of the fresh *leaves* (not pods) of the same plant. In addition to its superiority as a drug as already explained, the advantage of the *Aqáqiya* prepared from the pods is, *Acacia Arabica*, over all other varieties, is its great cheapness, which is speaking comparatively, dust cheap when prepared on a large scale.

The bark of *A. Arabica* is very fibrous, hard, rough, deep brown externally, rusty or reddish brown internally, and astringent in taste. It contains about 20 per cent. of tannin. The fresh legumes are long, slightly tomentose, ash-colored, and possess a very peculiar and characteristic appearance, viz., moniliform or contracted on both sutures between the seeds, so as to resemble a string of compressed beads. The dry pods have the same appearance, but are dry, more or less curved, and brown, dusky brown or ash-colored.

* Acacia Catechu, *Willd.* 220 and 221.

Habitat.—Found in many forests of Southern India.

Part Used.—An extract of the heart-wood.

Synonyms.—Black catechu, Catechu-nigrum, Terra-Japonica, Cutch, Indian-Catechu, *Eng.* Cachou, Cachou brun ou noir, *Fr.* Catechu, *Ger.* Kálá-kat*thá*, Kíkar-ká-kat*thá*, *Hind.* and *Duk.* Karuppu-ká*sh*ukaṭṭi, *Tam.* Nalla-kán*ch*u, *Tel.* Kaṛa-kaṭṭa, *Malyal.* Kappu-káchu, *Can.* Kálá-kat, *Beng.* Kála-kát, *Mah.* Kri*sh*na-khadira, *Sans.* Kaḷoka*th*-tho, *Guz.* Kalu-kaipu, *Cing.* Amé-*shá*zi, *Bur.*

Local Sources.—Met with in the local market.

Price.—Wholesale, Rs. 20 per maund of 37½ lbs.; retail or bazaar, As. 8 per pound.

Physiological Actions.—Powerful astringent.

Therapeutic Uses.—Although a powerful astringent, Catechu is not half as useful in diarrhœa and dysentery when administered *alone* as it is when used in combination with some other astringent and aromatic drugs, as is the case with all its preparations described in the *Pharmacopœia of India*. The compound-powder of Catechu is, therefore, very useful in the above-named diseases; in fact, it is one of the preparations most frequently used by me in the Triplicane Dispensary, particularly in the treatment of children. The Tincture of this drug is a very valuable adjunct to Mistura Cretæ, as mentioned in the *Pharmacopœia of India* and other medical works; but to ensure its best effects it should always be mixed in each dose of the mixture just before it is administered to the patient. From some cause or other its action is not so satisfactory when it is mixed with Mistura Cretæ and kept for use for a day or two.

According to my own experience Catechu is, in the form of injection, one of the most useful drugs in the treatment of gonorrhœa. As simple as the following formula is, it has proved successful in many cases, and sometimes even without the assistance of internal remedies.

℞ Pulveris Catechu, ℥iss.
Mucil. Acaciæ, ℥vi.
Aquæ puræ, ad. ℨiss. *Misce fiat injectio.*

A third part to be injected three times in the 24 hours. To ensure the desired effect, some care is necessary in injecting the medicine. Having filled a glass syringe with the injection, the patient should introduce its bulbous extremity into the urethra to the extent of an inch with his right hand. Then, holding upright the penis with his left forefinger and thumb, so as to compress the urethra against the syringe to prevent the escape of the fluid, he should pass the liquid freely into that canal by pressing down the piston with his right hand. The syringe should now be withdrawn, but the orifice of the urethra should still be compressed, and the fluid be retained for two or three minutes. On removing the finger and thumb, the injection will be thrown out by the elasticity of the urethra.

Preparations.—Compound powder, Tincture, Infusion and Injection. I have already described the last-named preparation (Injection) under the preceding heading "*Therapeutic Uses*," and the rest are chiefly in accordance with the description in the *Pharmacopœia of India*. Compound powder: Take of Black-catechu, in powder, four ounces; Kino and Rhatany-root, in powder, of each, two ounces; Cinnamon-bark and

Nutmeg, in powder, of each, one ounce. Mix them thoroughly, pass the powder through a fine sieve, and finally rub it lightly in a mortar. Keep it in a stoppered bottle. Tincture: Take of Black-catechu, in coarse powder, two ounces and a half; Cinnamon-bark bruised, one ounce; Proof-spirit, one pint. Macerate for seven days in a closed vessel with occasional agitation; press, strain, filter and add sufficient proof spirit to make one pint. Infusion: Take of Black-catechu, in coarse powder, one hundred and sixty grains; Cinnamon-bark, bruised, thirty grains; Boiling-water, ten fluid ounces. Infuse in a covered vessel for half an hour, and strain.

Doses.—Of the Extract or Catechu in powder, from fifteen to thirty grains; of the Compound powder, from fifteen to forty grains; of the Tincture, from one-half to two fluid drachms; and of the Infusion, from one to two fluid ounces.

European Drugs for which they may be substituted.—Pale-catechu, Oak-bark, Log-wood, Rhatany and Botany-Bay-Kino.

Remarks.—The Extract of *A. Catechu* or Black-catechu is met with in the Madras market either in quadrangular pieces or plates. In the latter case, they are generally from 4 to 7 inches long and from 2 to 4 inches broad, and about an inch in thickness. The drug is dark-brown in color, astringent and bitterish in taste, and breaks with a shining fracture. The drug contains a large proportion of catechu-tannic acid and a crystalline substance termed catechin.

There was a doubt in my mind about 15 or 16 years ago as to the nature of this catechu, and I thought it was not the produce of any species of Acacia. To remove this doubt I reared a few plants of *A. Catechu, Willd,* in my own compound, and felled them when they were more than 12 years' old and about a foot in diameter. In one of these trees the heart-wood was more than 6 inches in thickness and of a bluish-black color. Having converted a portion of this wood into chips and shavings, I boiled them in an earthen vessel in the open air. When the liquor was thick and strong I decanted it into another earthen vessel and continued the evaporation till it assumed the consistency of a soft extract, and then removed it to a China plate and allowed it to become dry in the sun. With the exception of the form the drug I prepared was quite identical in its physical, chemical and medical properties to the Black-catechu I have described above.

Dr. H. Warth has reported on the yield of catechu from different samples of the wood of *A. Catechu* in Oudh and Burma (*Indian Forester*, October, December 1890.) He finds that the professional makers of *kattah* work up the stems having white spots in the heart-wood, and the result of several experiments proves that the spotted wood yields more extract and more catechin than that without spots.—(D.H.)

END OF PART I.

INDEXES.

INDEX OF BOTANICAL AND SCIENTIFIC NAMES.

INDEX OF ENGLISH SYNONYMS.

INDEX OF GERMAN SYNONYMS.

INDEX OF FRENCH SYNONYMS.

INDEX OF HINDUSTANI SYNONYMS.

INDEX OF DUKHNI SYNONYMS.

INDEX OF TAMIL SYNONYMS.

INDEX OF TELUGU SYNONYMS.

INDEX OF MALYALIM SYNONYMS.

INDEX OF CANARESE SYNONYMS.

INDEX OF BENGALI SYNONYMS.

INDEX OF PERSIAN SYNONYMS.

INDEX OF ARABIC SYNONYMS.

INDEX OF SANSCRIT SYNONYMS.

INDEX OF GUZRATTI SYNONYMS.

INDEX OF MAHRATTI SYNONYMS.

INDEX OF BURMESE SYNONYMS.

INDEX OF CINGALESE SYNONYMS.