Papers on the plant Gynocardia odorata from which the Chaulmoogra oil is obtained / compiled from various sources by Richard C. Lepage.

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PAPERS

ON THE

PLANT GYNOCARDIA ODORATA

FROM WHICH THE

CHAULMOOGRA OIL IS OBTAINED.

COMPILED FROM VARIOUS SOURCES

BY

RICHARD C. LEPAGE

(LATE OF CALCUTTA).

SECOND EDITION.

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PREFACE TO SECOND EDITION.

—:—

SINCE the publication of the first edition of this pamphlet, Messrs. Corbyn, Stacey and Company have made complete arrangements for introducing the pure Chaulmoogra oil to the Profession and the public; the preliminaries are now perfected, and so far the remedy has been well received—by many enquiries for this new drug, and by notices in the Medical journals.

R. C. L.

October, 1878.

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INTRODUCTION.

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The purport of this pamphlet is to bring together all that has yet appeared in scientific and other publications of the plant from which the Chaulmoogra oil is obtained. The medical properties of this oil have been known for centuries to the Fakirs of India (mendicant priests), as a cure more especially for skin diseases and leprosy, and probably from a remote period has been used for such diseases by aboriginal tribes in certain parts of India.

But it was not until about thirty years ago it attracted the notice of a gentleman in Calcutta, who took means to get it introduced into the hospitals. In the year 1854, Dr. Frederick J. Mouat, formerly of the Indian Medical Service, contributed a paper to the "Indian Annals of Medical Science," a journal published by my own firm. This paper is here reprinted, and contains an account of some cases treated by Dr. Mouat.

About the same period that Dr. Mouat was introducing the remedy into the Calcutta hospitals, Dr. Hobson was similarly employed in Canton, with the oil sent there by Dr. Mouat, to which reference is made in his paper in the "Indian Annals." For Dr. Hobson's account, see the article herein given from the "Edinburgh Medical Journal."

Besides the extracts from the above-named journals, information has been gathered from other sources, comprising

principally what has been made public. Its value, however, as a curative agent, has not hitherto been made known in England except in isolated cases and through non-professionals.

A very interesting and valuable description of the plant appears in Bentley and Trimen's "Medicinal Plants" (1877), which the publishers, Messrs. J. and A. Churchill, have kindly permitted me to reprint. A beautiful coloured illustration of the plant and fruit (*Gynocardia odorata*) will be found in Part 26 of the work referred to.

One difficulty which has hitherto prevented the spread of this remedy, is the persistent adulteration, by the natives in India, of the oil expressed from the seed of the Chaulmoogra plant, thereby lessening its value and results in the treatment of diseases.

The pure oil is expensive, and offers a great inducement to the natives who keep dispensaries in the bazaars of India to increase their profits by adulterating the Chaulmoogra with other and cheaper oils. So universal has been this adulteration by the natives, that I was told by a medical man he had abandoned the use of it, finding the adulteration of the oil so difficult of detection.

Dr. Dymock (of Bombay), however, has made several experiments in detecting the adulterations, and with great success (see the paper from the "Pharmaceutical Journal," 1876), so that it is now open to any analytical chemist using the same tests to discover the pure from the adulterated oil.

The first object of myself and those associated with me in making the sale of this oil a commercial adventure will be to import it of undoubted purity.

Mr. Richard Jones, formerly a Professor in the Presidency College, Calcutta, and the gentleman referred to in Dr. Mouat's paper written in 1854, has for some years

been resident in England, having retired from the Government Educational Service of India, and knowing the medical value of this oil, has privately amongst his friends, and in a spirit of pure philanthropy, effected several cures. He introduced the oil to medical friends, and one in particular has most successfully used it in many cases. I have no authority at present to use the name of this gentleman, or remarkable proofs of the efficacy of this remedy could be adduced.

A letter from Professor Jones to myself will be found in this pamphlet.

An extract is also given from the report on oil-seeds and oils prepared officially for the Government of India (1876), which Dr. Forbes Watson of the India House obligingly sent me, and for which I beg to express my thanks.

I have been informed that the oil has all the power of mercury as a curative agent, without any deteriorating effect on the constitution. It is one of the simplest as well as one of the most powerful alteratives yet made known.

To Mr. Richard Jones must be awarded the credit of discovering that the Chaulmoogra oil was a certain cure for consumption in its early stage. He it was that first made experiments in consumptive cases, which resulted in great success, and the cures have been of a permanent character. Prior to this, the oil had only been known as a cure for diseases of the skin and blood, and a most powerful remedy for secondary syphilis. Particularly in reference to this last-named disease, *see Case No.* 3 in the paper from the "Indian Annals of Medical Science." The oil is a most valuable specific for this complaint.

It is only surprising that the information now collected has not been earlier compiled, and such a powerful remedy for many diseases brought prominently to public notice The lives of many who have sunk into an untimely grave

might otherwise have been saved, had this remedy been earlier known.

The pure Chaulmoogra oil is now procurable in England, and it is to be hoped that the medical profession will give it an extended trial.

R. C. LEPAGE.

LONDON, *March* 1878.

19, *Anson Road*, *Tuffnell Park*, *N.*

THE CHAULMOOGRA.

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NOTES ON NATIVE REMEDIES.

By F. J. Mouat, M.D., F.R.C.S., Bengal Medical Service.

(*Indian Annals of Medical Science*, *April* 1854.)

R. C. Lepage & Co., Calcutta.

I. The Chaulmoogra.

Some years since, when holding the office of Professor of Materia Medica in the Bengal Medical College, I turned my attention to the investigation of native remedies. I collected a large number of specimens of the Indian materia medica from all parts of Hindustan, and several examples of the indigenous drugs used in China and the Straits Settlements. At that time I had no wards at my disposal in which to test the reputed virtues of the remedies used by native practitioners; and the increase of official occupation afforded by the rapid spread of education in Bengal left me no leisure to accomplish my purpose.

Recently, the subject has again attracted my attention, and although I have as yet been unable to devote much time or consideration to it, I hope hereafter to be able to carry out a systematic series of observations in a direction of which all acknowledge the interest and importance.

It is with considerable reluctance that I venture to submit for the consideration of the profession in India a

few remarks upon the Chaulmoogra, as the opportunities which I have hitherto had of employing it are too few and restricted to enable me to recommend it with the confidence that I could wish. Its success was, however, so remarkable and indisputable in one well-marked case of the worst form of leprosy, that I venture to hope an extended application of it to that most loathsome and intractable of diseases may prove so successful as to secure the general introduction of the remedy.

It appears first to have been described by Roxburgh in the "Flora Indica" under the names of *Chaulmoogra odorata*.

The following is the account of it given by that excellent and accurate observer:—

"Chaulmoogra and Petarkura are the names of this tree, and of the drug hereafter mentioned which it furnishes. It is indigenous in the Sylhet district, and grows to a large size, equalling the largest mango trees, and when full grown may be compared to the great maple or sycamore (*Acer pseudoplatanus*). It blossoms in April and May, and the seed ripens about the close of the year; when the fruit is gathered, the seed is carefully taken out, dried, and sold to the native dealers in drugs.

"The seeds are employed by the natives in the cure of cutaneous diseases. When freed from the integuments, they are beat up with clarified butter into a soft mass, and in this state applied thrice a day to the parts affected."

In the last edition (3d, 1853, pp. 323, 324) of Lindley's "Vegetable Kingdom," it is placed in order CIX., *Pangiaceæ*, which are thus described:—

"*Trees.*—Leaves alternate, stalked, entire, or somewhat lobed. Flowers axillary, solitary, or fascicled, or in few flowered racemes ♂ ♀.

"Sepals 5, rarely 2, 3, or 4. Petals 5, rarely 6. Scales as many, opposite the petals ♂. Stamens 5, or 00; not a

rudiment of ♀ ♀; sterile stamens equal in number to the petals, rarely more. Ovary free, 1-celled; ovules 00, attached to 2-6, parietal placentæ. Capsules succulent, indehiscent, 1-celled. Seeds 00, large; albumen abundant, oily; embryo nearly as large as the albumen; radicle protruded; cotyledons generally leafy and veined.—*Bennett.*

"What the distinction is between these plants and Papayads, except that the last are monopetalous, and have no faucial scales in the ♀ flowers, it is hard to say. Mr. Bennett throws no light upon the matter, and I am unable to supply any.

"The species are found in the hotter parts of India. All are poisonous plants. The seeds of *Gynocardia odorata* are employed extensively by the natives of India in the cure of cutaneous disorders. When freed from the integuments, they are beaten up with clarified butter into a soft mass, and in this state applied thrice a day to the parts affected."

The seeds yield by expression a bland fixed oil, with a peculiar and slightly unpleasant smell and taste, with the faintest possible after-flavour of the bitter almond. The oil procured from the bazaars is invariably impure, but I have not ascertained with what other matters it is adulterated. It appears to have been long known to and prized by the natives in the treatment of leprosy, and few of the Fakirs travelling about the country are unacquainted with its properties. I was first informed of its value by Mr. Jones, the headmaster of the Hindoo College, a gentleman of eminent acquirements, who brought it to the notice of other practitioners in this city, and at whose recommendation it was tried in the Leper Asylum, with a favourable result.

Case I.—On the 6th of July last, an unfortunate Creole, of Bourbon, who had long been an inmate of the Leper

Asylum, was picked up in the streets in a state of insensibility, and brought by the police to the Medical College Hospital. Upon admission to my wards, he was found to be labouring under the effects of alcohol. Signs of *delirium tremens* soon set in, and for some days he suffered from an aggravated attack of that disease. The irritability of stomach was so great as to be overcome with the greatest difficulty, and his violence was at times so uncontrollable as to need the restraint of the strait-waistcoat. All this yielded to the usual treatment, when the man was found to be a loathsome leper. His feet were bound up with filthy rags, his body exhaled an extremely offensive odour, and he was nearly reduced to a skeleton, so great was his emaciation.

His body was covered with livid patches, the toes of the left foot were without nails, and swollen at the extremities. Upon the sole of this foot there were three large, ragged, excavated ulcers, with hardened livid edges, and an offensive sanio-purulent discharge. One of them near the heel was of the size of a rupee, had destroyed the skin, fascia, and muscles, and exposed the bones beneath them.

There was a similar ulcer on the sole of the right foot, and on the dorsum of both feet were excoriations of a leprous character. He was labouring under diarrhœa and great general debility.

After cleaning the surface of the ulcers, I dressed them every day with the oil of Chaulmoogra, and gave him internally a pill of the seed beaten into a pulp, six grains three times daily.

For nearly a fortnight there was no perceptible amendment, but after this the progress of the cure was rapid. The ulcers healed by healthy granulation, the livid spots gradually disappeared, the general health of the patient improved, and he declared that he was better than he had been for some years previously. He left the hospital

clandestinely on the 10th of September, 1853, and I have not since heard of him.*

Upon inquiring into his history, I found that he had been for nearly eighteen months an inmate of the Leper Asylum.

It is manifestly impossible to attempt to generalise from a single case, or to ascertain, in the instance above recorded, how much of the improvement was due to the regularity and nourishing diet of the hospital, and what proportion of the cure may fairly be assigned to the remedy. The result is, I venture to believe, sufficiently encouraging to justify a further trial of the Chaulmoogra in leprosy.

Case II.—S. C., ætat 26, a stout young man of scrofulous habit, was admitted to my ward on the 18th of May, 1853, with enormous enlargement and ulceration of the parotid sub-maxillary glands, cleft palate, and ulceration of the roof of the mouth.

Previous history.—He was born in Calcutta, of poor parents, and when two years of age suffered from fever and enlargement of the spleen. For these he was, according to his father's statement, treated in the General Hospital, where he was salivated, lost several of his teeth, and became greatly emaciated, without any perceptible diminution of the spleen.

He was accordingly removed, and subsequently treated by a Koobera, in whose hands he seems to have recovered from the splenic disease.

Since that time he has never enjoyed good health. He has frequently suffered from ophthalmia and pains in the jaws, and was so weakly and ricketty a child that he was long unable to walk upright.

* Since the above was written, I am informed by Dr. R. Stuart that the man returned to the Leper Asylum; that his general health is good, and that the disease has not advanced.

At twelve years of age he was taken to England, where he remained for five years.

During that time he often suffered from sore eyes, and had a severe attack of scarlatina. He is at present purblind, and has been completely deaf for the last seven years. The deafness came on gradually, without pain or discharge from the ears. The left lachrymal sac and nasal duct have been closed for nearly three years. His utterance is thick and very indistinct.

The glands began to swell in September, 1852, and he was under treatment in the General Hospital for four months before he came to me.

Symptoms on admission.—All the glands under the lower maxilla swollen, except the right parotid. They are indurated, but painless on pressure. The left parotid, which is now nearly of the size of a hen's egg, ulcerated two months ago, and discharges unhealthy, ichorous pus. The skin covering the gland is honeycombed, and at the openings are large, flabby, unhealthy granulations, covered with tenacious creamy pus. On the outer aspect of the left masseter muscle is a small, painful tumour. Near the left inner canthus the lachrymal sac is much enlarged, and pus exudes from the lachrymal puncta on pressing the tumour, but there is no external opening. The skin surrounding the swelling is puffy and œdematous. The axillary and inguinal glands are not affected.

Upon the surface of the hard palate there is an ulcer extending from the uvula to the teeth: the soft palate is nearly destroyed. The mucous lining of the left nostril is so much swollen as to close the passage. There is neither cough nor expectoration, nor can frequent and careful examination detect a trace of tubercle in the lungs. The bowels are somewhat costive and irregular, but the appetite is good, and in other respects the general health of the patient is not impaired.

Treatment.—At first occasional mild laxatives, with cod-liver oil were given; the mouth was frequently washed with a strong alum gargle, and sulphate of copper was applied to the ulcers. The external tumours were painted with a strong solution of iodine, forty grains to an ounce of the officinal tincture. The patient was also placed on generous diet. These means were persevered in until the 15th of June, when the external ulcers were touched with strong nitric acid.

As no benefit appeared to be derived from the above plan of treatment, on the 20th of June I began to administer the Chaulmoogra, in two pills of six grains each, three times a day. The external ulcers were dressed with the oil of the Chaulmoogra. The gargle and blue-stone wash were continued.

In less than ten days an evident beneficial change occurred. The ulcers became healthy looking; florid granulations soon appeared and filled up the surface, and the skinning over of the sores advanced rapidly.

On the 9th of July, eighteen days from the commencement of the exhibition of Chaulmoogra, the patient felt so much better, and the sores were so nearly cicatrised, that he became impatient of remaining in hospital. He was accordingly made an out-patient, and attended regularly for another fortnight, to obtain his pills and dressing. The ulcers were by that time completely healed, the glands had diminished much in size, and as he considered himself cured, he ceased to attend.

Two months afterwards he was admitted to one of the surgical wards for an attack of syphilis, when it was found that the healing of the ulcers was permanent.

Case III.—An old case of secondary syphilis in a discharged soldier. The bones of the nose were completely

destroyed, as was the soft palate ; the pharynx was covered with unhealthy ulcers; the gums were swollen and painful; deglutition was difficult, and the patient had lost his voice from chronic laryngitis. He was a confirmed drunkard, and in a state of great general debility. In fact, he had been lying about the streets of Calcutta, constantly intoxicated and squalid in appearance, for some years past. He was rejected from one of the surgical wards as a hopeless case.

After regulating the natural functions and cleaning the sores, he was put under a course of Chaulmoogra, a six-grain pill being given thrice daily.

The only other treatment resorted to was touching the ulcers with a strong blue-stone wash, and an occasional laxative.

The general health of the man improved rapidly, the sores healed, and he left the hospital stout and well in six weeks.

Besides the above, I have used the Chaulmoogra in a mild case of ichthyosis, in three cases of syphilitic rheumatism, in two of scrofulous enlargement of the cervical glands, in two cases of elephantiasis on the face, and in an example of leucopathia of ten years' standing, with apparent benefit. I have not leisure, on the eve of my departure, to furnish any details of these cases, nor were they of sufficient interest to need it. The remedy requires much more extended employment before any sound judgment can be formed of its *modus operandi* and probable value. My object in publishing these crude notes is to direct the attention of the profession to it as a cheap, readily procurable, and, it may be, efficient agent in the treatment of a large and not unimportant class of cases met with in all London hospitals.

I have sent a considerable quantity of it for trial in leprosy at the Kum-le-Faw Hospital, near Canton, and Mr. Piddington has despatched some of it to the Mauritius, also

for use in the same disease. I hope, therefore, that the experience of others may, ere long, be made known to the profession.

With regard to the exhibition of the remedy, it may be taken in the form of pill ; or the seed itself, stripped of the integument, may be administered. Six grains in the former case, or three seeds in the latter, may be given daily, and the dose may gradually be increased to three or four times that amount. In large quantity, however, it is apt to disagree, causing nausea and irritability of stomach. A more elegant method of administering it would be in the form of the oil, beginning with probably five or six minim doses, and gradually increasing the amount. I have no personal experience of the employment internally of the oil.

Native practitioners direct their patients while taking the Chaulmoogra, to avoid all salt meats, acids, spices, and sweetmeats, but to aid its operation with butter, ghee, and oily articles of diet. It would be well to bear this in mind, and to regulate carefully the diet of all subjected to the use of Chaulmoogra.

TREATMENT OF LEPROSY IN CHINA.

(*From the "Edinburgh Medical Journal," Vol.* 1, *July* 1855 *to June* 1856, p. 50.)

It is generally known that an inveterate and loathsome form of leprosy is endemic in several parts of China, and that the subjects of it are frequently immured for life in hospitals at the instance of Government, by whom the poor people are treated rather as animals than as patients. At all events, when the disease is severe, it is generally regarded as incurable. Its treatment has been in many instances undertaken by the American and British medical missionaries, who have done so much good for the Chinese within the last twenty years, but too often with but little success. It is very gratifying, therefore, to find it recorded in the report for 1853-54 of the Missionary Hospital in the western suburbs of Canton, under the care of Dr. Hobson, that successful trials have recently been made of a new remedy for the cure of the disease.

This is the seed of the *Flacourtiaceæ*, a plant known in Eastern Asia by the name of CHAULMOOGRA. The seeds are coarsely pounded, and given internally in drachm doses twice a day for a considerable time.

The expressed oil of the seeds is applied occasionally to the affected portions of the skin by friction. Dr. Hobson writes thus of the results of this treatment :—

"I have seen two cases certainly cured, and several others much benefited; some are still under treatment; the remedy requires to be steadily persevered with for several months. Salient aperients are administered along with it occasionally. The first appearance of improvement is in the eruption becoming less prominent and red, while whitish scales appear round the margins, and the central parts gradually assume the appearance of healthy skin."

THE CHAULMOOGRA.

(*From the "American Journal of Medical Sciences," N.S., Vol.* 30, p. 493, *Philadelphia.*)

This drug, to which attention has been drawn by Dr. Mouat ("Indian Annals," April 1854), is the fruit of the Chaulmoogra, or *Gynocardia odorata*, and is indigenous to the Sylhet district of India. The seed, enclosed in a succulent and indehiscent pericarp, is dried and subjected to expression, and a bland fixed oil is thus obtained, which has been long known and prized by the natives and travelling fakirs as a remedy for leprosy. Dr. Mouat relates some cases in which he has used it. One is a case of leprosy. Six grains of the seed were administered three times a day, and the ulcers were dressed with the oil. A rapid improvement followed this treatment. He has used it also in scrofulous glandular enlargements, constitutional syphilis, in a mild case of ichthyosis, in elephantiasis of the face, &c., with benefit.

Dr. Hobson ("Medical Times and Gazette," March 1855), who practices among the Chinese in China, has also found the Chaulmoogra of real service in leprosy. He has seen two cases cured, and several much benefited by a steady employment of the drug. He gives forty grains twice a day, and rubs the eruption occasionally with the oil. —*Association Medical Journal*, August 17, 1855.

Extract from Report on the Oil-Seeds and Oils in the India Museum or Produced in India. Prepared by Dr. M. C. Cooke, under the direction of Dr. Forbes Watson, India Museum, 1876. [P. 16.]

Sect. II. *Fats for Medicinal Uses.*

Gynocardia odorata, *R.Br.; Roxb., Cor. Pl.*, 95 t. 290; *Hook., Il. Ind.*, i. 195.

Chaulmoogra odorata, *Roxb., Il. Ind.*, iii. 835.

Chilmoria dodecandra, *Hamilt., Trans. Linn. Soc.*, xiii. 500

Tree.—Branches slender, flexuous, quite glabrous; leaves oblong or linear oblong, abruptly acuminate, shining above; flowers sweet-scented, yellowish, in large fascicles on the trunk, solitary or few together in the leaf axils.

Hab.—Sikkim and Khasia Hills, eastwards to Chittagong, Rangoon, and Tenasserim.

Native Synonyms.—Chaulmoogra, Piturkurra, B.

Seed.—Fruit sub-globose, 3-5 in. diameter, rhind thick, hard, rough; seeds 1 in. long, irregular by compression, with a grey smooth brittle testa.

Oil.—The seeds yield by expression about 10 per cent. of a thick fixed oil, of unpleasant flavour and rather offensive smell (O'Shaughnessy).

Uses.—The thick oil is employed by the natives in the treatment of cutaneous diseases. The seeds are said to have been used advantageously as an alterative tonic in scrofula, skin diseases, and rheumatism.

In China a seed called Ta-fung-tze is imported from Siam, where it is known as Lukrabo, and used in cutaneous complaints. Dr. Porter Smith assumes it to be the produce of the present species, from which Mr. D. Hanbury has expressed his dissent.

The Museum collection includes seed from Moulmein and Rohilcund, and fat from Calcutta and Chittagong.

Extract from the "Pharmacopœia of India," by EDWARD JOHN WARING, M.D., *India Office*, 1868. London, W. H. Allen & Co. Waterloo Place. [Pp. 26, 27.]

Gynocardia odorata, *R.Br.*

Chaulmúgra, *Roxb.*, *Corom. Plants*, t. 299.

Habitat.—Forests of the Malayan peninsula and Eastern India, as far north as Assam, extending thence along the base of the Himalaya as far west as Sikkim.

Officinal Part.—The seeds (*Gynocardiæ Semina*, Chaulmúgra seeds), about an inch in length, of an ovoid form, rendered more or less irregular by mutual compression. Each seed has a greyish-brown, smooth, and fragile testa, within which is a mass of oily albumen, enclosing an embryo with large, heart-shaped, three-nerved cotyledons. They yield by expression a fixed oil (*Oleum Gynocardiæ*), which has a peculiar and slightly unpleasant smell and taste. The oil procured from the bazaar is usually impure.

Properties.—Alterative tonic; in large doses, emetic.

Therapeutic Uses.—In leprosy it has been used with excellent effects; it has also been advantageously employed in scrofula, skin diseases, and rheumatism.

Dose.—Of the seeds coarsely powdered, about six grains, thrice daily in the form of a pill; gradually increased to three or four times that amount, or until it causes nausea, when the dose may be diminished, or the use of the remedy suspended for a time. This is the best form of administration. The dose of the oil is from five or six drops, gradually increased, as in the case of the seeds. The oil is also used as a local stimulant, or the seeds may be used in the following form, officinal in the Bengal Pharmacopœiæ.

Chaulmúgra Ointment (Unguentum Gynocardiæ).—Take of Chaulmúgra seeds a sufficiency, remove the husks, and

beat the seed into a paste with as much simple ointment as is requisite to give it proper consistence.

Used in many skin diseases, especially in herpes and tinea.

[P. 440 of same book.]

Dr. B. N. Bose reports very favourably of it in leprosy, employed both internally and externally. Dr. R. C. Bose states that he has often carried the dose of the oil to half a drachm and a drachm without observing any ill effects.

Extract from the "The Bengal Dispensatory," by W. B. O'Shaughnessy, M.D., *Calcutta*, 1842. [P. 206.]

Nat. Order XII.—*Flacourtiaceæ*. This group is of very little interest, containing but two species requiring particular notice.

Gen. Chaulmoogra.

Sp. 1. Chaulmoogra Odorata.

Vern. Chaulmoogra, Petarcura.

Off. Seeds.

A native of Sylhet, and the seed employed extensively in the treatment of cutaneous diseases.

The seeds are various in shape, nearly oval, smooth, grey, hard. Embryo white.

The seeds yield by expression about 10 per cent. of a thick, fixed oil, of unpleasant flavour, and rather offensive smell; ʒi given to a dog caused violent vomiting in fifteen minutes. They are much used by the natives in the treatment of cutaneous disorders, being beaten up with ghee into a soft mass, and applied three times daily.

Extract from "Pharmacographia." A History of the Principal Drugs of Vegetable Origin met with in Great Britain and British India, by FLÜCKIGER and HANBURY. London, Macmillan & Co., 1874. [Pp. 70, 71.]

Bixineæ. Semen Gynocardiæ. Chaulmugra Seed. Botanical Origin.—Gynocardia odorata, *R.Br.* (Chaulmoogra, *Roxb.* Hydnocarpus, *Lindl.*) A large tree with a globular fruit of the size of a shaddock, containing numerous seeds immersed in pulp. It grows in the forests of the Malayan peninsula and Eastern India as far north as Assam, extending thence along the base of the Himalaya westward to Sikkim.

History.—The inhabitants of the south-eastern countries of Asia have long been acquainted with the seeds of certain trees of the tribe Pangieæ (ord. Bixinæ) as a remedy for maladies of the skin. In China a seed called Ta-fung-tsze is imported from Siam,* where it is known as Lukrabo, and used in a variety of cutaneous complaints. The tree affording it, which is figured in the Pun-tsao (circa A.D. 1596), has not been recognised by botanists, but from the structure of the seed it is obviously closely related to Gynocardia.† The properties of *G. odorata* were known to Roxburgh, who, Latinising the Indian name of the tree, called it (1814) *Chaulmoogra odorata.* Of late years the seeds have attracted the notice of Europeans in India, and having been found useful in certain skin diseases, they have been admitted a place in the Pharmacopœia of India.

* The Commercial Report from Her Majesty's Consul-General in Siam for the year 1871, presented to Parliament August 1872, states that 48 peculs (6400 lb.) of Lukkrabow Seeds were exported from Bangkok to China in 1871.

† Hanbury, Notes on Chinese Materia Medica (1862), 23. Dr. Porter Smith assumes the Chinese drug to be derived from *G. odorata*, but, as I have pointed out, the seeds have a much stronger testa than those of that tree.—D. H.

Description.—The seeds, 1 to 1¼ 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 1-50th of an inch), brittle, smooth, dull-grey ; the copious oily albumen encloses a pair of large, plane, leafy, heart-shaped cotyledons with a stout radicle.

Microscopic Structure.—The testa is chiefly formed of cylindrical thick-walled cells. The albumen exhibits large angular cells containing fatty oil, masses of albuminous matter, and tufted crystals of calcium exalate. Starch is not present.

Chemical Composition.—No chemical examination of the seeds has yet been made.

Uses.—The seeds are said to have been advantageously used as an alterative tonic in scrofula, skin diseases, and rheumatism. They should be freed from the testa, powdered, and given in the dose of six grains gradually increased. Reduced to a paste and mixed with simple ointment, they constitute the *Unguentum Gynocordiæ* of the Indian Pharmacopœia, which, as well as an expressed oil of the seeds, may be employed externally in herpes, tinea, &c.

Substitute.—It has been suggested that the seeds of *Hydnocarpus Wightiana*, Bl., a tree of Western India, and of *H. venenata*, Gärtn., native of Ceylon, might be tried where those of Gynocardia are not procurable. The seeds of both species of Hydnocarpus (formerly confounded together as *H. inebrians*, Vahl) afford a fatty oil which the natives use in cutaneous diseases.*

* Waring, Pharm. of India, 1868, 27.

MEDICINAL PLANTS.

By BENTLEY and TRIMEN. J. & A. Churchill, 1877.

28. Gynocardia odorata, *R. Brown in Roxb., Pl. Coromandel*, p. 95 (1819).

Chaulmoogri. Petarcurrah.

Syn.—Chaulmoogra odorata, *Roxb.* Chilmoria dodecandra, *Ham.*

Figure.—Roxburgh, Pl. Coromandel, t. 299.

Description.—A large tree, much branched; branches slender, bark rather smooth, ash-coloured. Leaves alternate, somewhat drooping, distichous, shortly stalked, without stipules, 6-10 inches long, rounded at the base, suddenly acuminate and acute at the apex, quite entire, glabrous, shining above, veins very prominent beneath. Flowers unisexual, diœcious, large, on smooth curved peduncles 1-2 inches long, coming off in large clusters usually from the trunk in the female, or in smaller ones usually from the younger branches in the male tree; bracts minute, round the base of the peduncles. Male flower:—calyx cupshaped, irregularly splitting into (usually) 3 segments, thick, smooth; petals 5, large, spreading, strongly imbricate in the ovoid bluntly pointed buds, about $\frac{3}{4}$ inch long, oval, obtuse, thick with thin margins, smooth, pale yellow, each provided with an ovate, acute, denticulate, thin, dark yellow, spreading petaloid scale attached to its base and scarcely $\frac{1}{3}$ its length; stamens very numerous, hypogynous, spreading, shorter than the petals, filaments tapering, hairy, anthers linear, basifixed, no pistil. Female flowers:—calyx and corolla as in the male, but the petals somewhat larger; stamens represented by

10-15 small, linear, erect, hairy staminodes around the ovary; ovary very large, ovoid, rounded on the summit, smooth, 1-celled, with numerous ovules attached to 5 parietal placentas; styles 5, short, distant, spreading in a circle; stigmas peltate, dilated, lobed. Fruit nearly spherical, on a woody stalk, very large, about 3½ inches in diameter, rough, ash-grey, indehiscent, 1-celled, containing many seeds immersed in pulp; pericarp hard, thick. Seeds 1-1½ inches long, irregularly ovoid, and variously flattened from mutual pressure, pale yellowish-grey, smooth testa; brittle, tegmen very thin; embryo large in the axis of the abundant endosperm, with flat leafy cotyledons with a cordate base, and a large very obtuse radicle prominent beneath the testa.

Habitat.—This tree is a native of Pegu, Tenasserim, and other parts of the Malayan peninsula, and extends into India, where it is found in Assam, Khasia, and Sikkim, in the hills; but it does not reach the central or western parts.

The flowers are very fragrant, and appear in April and May; the large fruit, which has somewhat the look of a shaddock, is ripe in December. *Roxb., Fl. Indica*, iii. p. 835; *Hamilton, in Trans. Linn. Soc.*, xiii. p. 500; *Hook. f., Fl. Brit. Ind.*, i. p. 195; *Lindl., Fl. Med.*, p. 109.

Official Part and Name.—GYNOCARDIÆ SEMINA; the seeds (I.P.) They are not official in the British Pharmacopœia, or the Pharmacopœia of the United States.

General Characters and Composition.—These seeds, which are known in India under the names of *Chaulmugra*, *Chaulmogro*, or *Chaulmoogra*, have an ovoid form, which is of an irregular character in consequence of their mutual pressure having made them more or less angular or flattened. In length they vary from about 1 inch to 1¼; in breadth they average half-an-inch; and they weigh about 35 grains each. They are covered by a very thin, brittle, smooth, greyish-brown or dull-grey testa, within which is a

dark brown oily nucleus. They have a faint, peculiar, somewhat unpleasant taste and odour.

These seeds have not been submitted to any complete chemical examination, but they yield by expression a fixed oil which possesses in a marked degree their taste and odour, and in which their properties appear essentially to reside. This oil, as sold in the bazaars of India, is commonly very impure, and the means of detecting these impurities, hitherto very difficult, has recently been the subject of careful investigation by Dr. Dymock. When pure, the oil is described as clear, of a pale sherry colour, with the odour of chaulmoogra, and a sp. gr. of 0.900. By keeping it throws down a granular white fatty deposit. The oil obtained by Dymock by boiling the powdered seeds in water was of a golden sherry colour, fluid consistence, strong odour of chaulmoogra, and formed no deposit. It would appear from Dymock's experiments that genuine chaulmoogra oil shows two marked peculiarities when acted upon by sulphuric acid ; thus twenty minims were placed in a watchglass and one minim of strong sulphuric acid, B.P., added, and on stirring with a glass rod, the oil, whether drawn cold or by means of heat, gave first a burnt sienna, and afterwards a rich olive-green colour. If drawn cold, a tenacious reddish brown resinous mass, which could not be mixed with the rest of the oil, was found to form round the drop of acid ; but in the case of the oil extracted by boiling, no tenacious resinlike mass was formed under similar treatment with sulphuric acid.

Medical Properties and Uses.—Chaulmoogra seeds are alterative tonic in moderate doses, and emetic in large doses. They have been employed with benefit in the form of a pill given three or four times a day, in doses of about six grains, gradually increased until they cause nausea, in scrofula, skin diseases, rheumatism, and leprosy. The oil is also given in doses of five or six drops, gradually increased in

similar cases. The kernels of the seeds beaten into a paste with simple ointment, as also the fixed oil of the seeds, are likewise employed as a local stimulant in various skin diseases, &c.

Substitutes.—The seeds of *Hydnocarpus Wightiana* Bl., and of *H. venenata*, Gärtn., both of which species were formerly confounded together under the name of *Hydnocarpus inebrians*, Vahl, are reputed to possess similar properties to those of Chaulmoogra. They are readily distinguished from these seeds by their smaller size, more flattened character, and dirty-white colour. They also yield by expression a fatty oil, of a greenish colour, and with an odour somewhat resembling that of Chaulmoogra, but more acrid. When treated with sulphuric acid in the way above mentioned in the case of Chaulmoogra oil, the cold-drawn oil is described by Dymock as forming a tenacious resinous mass like it, while the rest of the oil turns of a light green colour ; while the boiled oil, which is of a deeper green colour, when treated with acid, becomes at first of a sienna brown, and ultimately a light green colour. Hence these oils may be readily distinguished from the oils prepared in a like manner from Chaulmoogra seeds. They have similar properties, and are used both internally and externally in similar cases to those of Chaulmoogra.

CHAULMOOGRA OIL.

BY W. DYMOCK.

THERE has long been a considerable difficulty in distinguishing the genuine oil from the mixtures which are sold by the native druggists. This has led to my making the following experiments with a view to the discovery of some ready test for admixture with other oils.

In the first place, I made two standard samples of the oil from the seeds carefully picked : the first cold drawn, the second by boiling the powdered seeds in water. The cold-drawn oil was of a pale sherry colour ; after standing for a few days it became quite clear, and was drawn off from the sediment, which was scanty and black. The oil remained clear for nearly two months, and then began to throw down a granular white fatty deposit, but not a very abundant one. The sp. gr., after shaking and allowing air bubbles to escape, was 0.900. Twenty minims were placed in a watchglass, and one minim of strong sulphuric acid, B P., added ; on stirring with a glass rod, a bulky, tenacious, resinous mass, of reddish-brown colour, was formed round the drop of acid, and the oil, after having been stirred a few minutes, turned of a rich olive green colour, the resinous portion all the time remaining separate and retaining its colour and transparency.

In preparing the sample of boiled oil, it was found that, after boiling and expressing the marc, a quantity of oil and oily emulsion rose to the top of the vessel in which the liquid had been allowed to cool. This was skimmed off and heated to expel water ; the result was a clear oil of golden sherry colour. During the heating process a quantity of brown resin separated. Twenty minims of this oil treated with one minim of acid turned at first of a burnt sienna

colour, which changed after a few minutes' stirring into a rich olive green. The tenacious resinous mass was not formed as in the cold drawn oil ; its formation, therefore, appears to depend upon the presence of the resin of the seed, which is separated during clarification when the oil is prepared by boiling.

Several commercial samples were now tested with sulphuric acid with the following results :—

Description of Sample.	Behaviour with Acid.	Conclusions.
No. 1. Colour golden sherry ; consistence fluid ; no deposit ; strong odour of Chaulmoogra.	Turned at first burnt sienna colour, afterwards rich olive green; no tenacious resin-like mass formed.	Genuine oil extracted by boiling.
No. 2. Colour pale sherry ; consistence fluid ; no deposit ; sp. gr. 0·910 ; odour of Chaulmoogra not very strong.	Turned at first burnt sienna colour, and a small resinous mass formed round the drop of acid. Upon stirring, the bulk of the oil turned a pale dirty green.	About one-third genuine cold-drawn oil mixed with two-thirds of some cheap oil, probably sesame.
No. 3. Colour and consistence of commercial soft soap. Strong odour of Chaulmoogra.	Turned a dirty greenish brown. Small resinous particles afterwards separated.	Probably a mixture of genuine oil with some solid fat.
No. 4. Colour pale sherry ; consistence fluid ; no deposit ; good odour of Chaulmoogra.	Turned a dirty greenish brown. No resinous mass.	A mixture of boiled oil with some cheap oil, perhaps ground-nut.
No. 5. Same character.	Do.	Do.

It would appear that genuine Chaulmoogra oil shows two marked peculiarities when treated with sulphuric acid in the way above mentioned ; viz., the oil, whether drawn cold or by means of heat, gives first a burnt sienna, and afterwards a rich olive green colour ; if drawn cold, a tenacious reddish brown resinous mass forms round the drop of acid, and cannot be mixed with the rest of the oil.

Several of the common cheap oils likely to be used as

adulterants were tested by sulphuric acid with the following results :—

Ground-nut	. .	Turned light brown.
Cocoa-nut	. .	,, opaque white.
Castor-oil	. .	,, dirty white.
Sesame	. .	,, pale dirty green.
Linseed	. .	,, dirty greenish brown, bulky tenacious brown resinous mass also formed.
Several animal fats		,, different shades of brown.

The oil of *Hydnocarpus Wightiana* has an odour resembling Chaulmoogra, but more acrid ; the colour is greenish, not unlike some samples of cajuput oil. If kept long, it throws down a white fatty deposit like that of Chaulmoogra. With sulphuric acid a tenacious resinous mass is formed in the cold-drawn oil, and the rest turns of a light green colour. The boiled oil is of a deeper green colour, and with acid it first turns sienna brown and afterwards a light green. The seeds of *Hydnocarpus* cannot be mistaken for those of *Gynocardia ;* they are much smaller, flattened, and of a dirty white colour. The kernel is dark brown, like that of the *Gynocardia.—Pharmaceutical Journal*, March 1876.

Bombay, *Feb.* 25, 1876.

LETTER FROM PROFESSOR RICHARD JONES TO R. C. LEPAGE.

Thursday, 31*st January*, 1878,
19 New Ormond Street.

My dear Mr. Lepage,—I should have written you earlier, but I have unfortunately been laid up with a cold and neuralgia. I am now getting better.

With regard to the Chaulmoogra oil, it must now be about thirty years since Dr. Jackson, at my suggestion, made trial of it in the Leper Asylum. The oil has been long known to the natives of India as a remedy for leprosy and skin

diseases generally, but I am not aware that any record exists of its having been prescribed by European physicians in early times.

After Dr. Jackson had introduced the oil into the Leper Asylum, it was more generally used by the natives, if not by our doctors, though no cases have been published, except by a physician in the Bombay Presidency, who speaks very favourably of it.* Dr. Mouat's cases, which appeared in the "Indian Annals of Medical Science," I think you have.

When in Calcutta, my time was so occupied with my public duties, that I had no leisure to make further researches into the subject.

On my return to England, I again took up the inquiry, and found that the oil was a specific in consumptive cases, if administered before the disease had made serious inroads into the constitution. I also had it tried in cases of lupus and secondary syphilis by medical friends, who considered it a most powerful alterative, acting with great certainty and rapidity.

The curative powers of the oil are perhaps most striking in cases of scrofula in children.

The dose for adults is from 6 to 15 drops, taken three times daily, a short time after meals.

The dose for infants is from 2 to 3 drops.

The oil is best administered in cod-liver oil, but when the latter oil cannot be taken, glycerine or milk may be used instead.

In skin diseases the oil should be also applied externally. —I remain, yours very sincerely,

RICHD. JONES.

* Dr. W. Dymock.

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