

Observations on the properties and effects of the expressed oil of the seed of *Croton tiglium*; together with the botanical history, and a correct coloured engraving of the plant / [John Frost].

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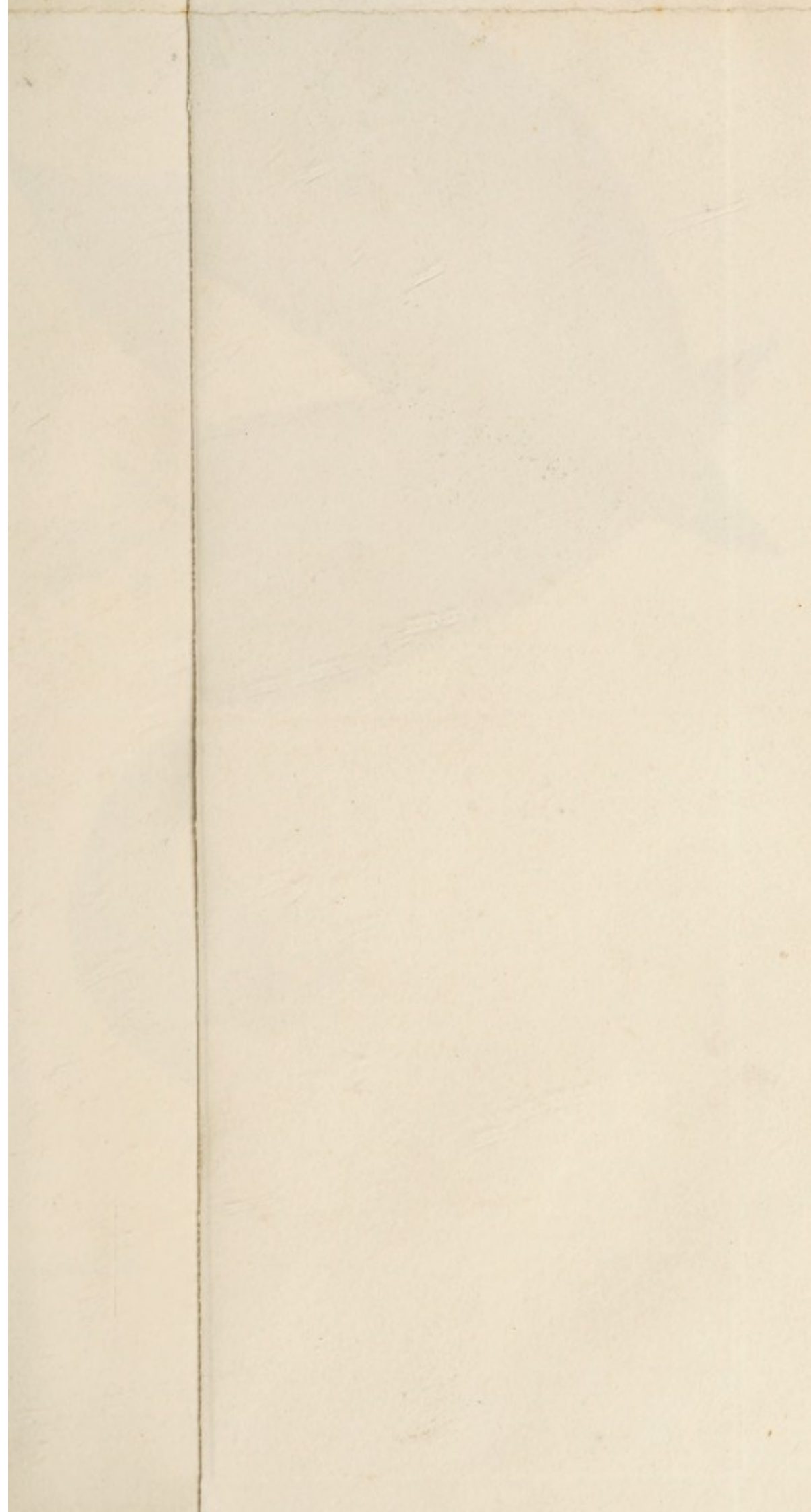
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Croton Tiglium.

J. Frost del.

a. Female Flower.

b. Male Flower.

c. Capsules showing the persistent Calyx.

d. Section of the Capsule, showing the trilocular construction.

e. A Seed.

W. Clark sculp.

5.

OBSERVATIONS
ON THE
PROPERTIES AND EFFECTS
OF
THE EXPRESSED OIL
OF THE SEED OF
CROTON TIGLIUM;
TOGETHER WITH
The Botanical History,
AND A CORRECT COLOURED ENGRAVING,
OF THE
PLANT.

“Of all the medicines lately introduced, perhaps none has excited more
attention than the expressed oil of the seed of *Croton Tiglium*.”

BY JOHN FROST, F.S.A. F.L.S. F.H.S.
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ON BOTANY AT ST. THOMAS'S HOSPITAL.

London:
WILLIAM JACKSON, KING STREET, BOROUGH.

1827



London:
WILLIAM PEARSON, KING STREET, BOROUGH.

DEDICATION.

TO

WILLIAM GEORGE MATON,

M.D. F.R.S. F.S.A.

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS OF
LONDON, VICE PRESIDENT OF THE LINNÆAN SOCIETY,

&c. &c.

SIR,

There is no person under whose protection the following pages could be so appropriately placed as your's,—as it was during your Presidency of the Medico-Botanical Society that I devoted my attention to the subject of *Croton Tiglium*,—and through your kindness that I was enabled to obtain access to several authorities not

within the reach of every enquirer. Trusting
you will receive this as a public tribute of
respect for your talents, and gratitude for
many acts of friendship,

I remain, Sir,

Your very faithful Servant,

JOHN FROST.

PREFACE.

THE Author has, at the request of many of his friends, collected together several papers which he had communicated to various periodical publications,—and added an unpublished paper, on a new proximate vegetable principle pervading several Genera of Plants. He hopes this pamphlet may be useful, as a collection of facts relating to the nature and properties of the Expressed Oil of the Seed of the Purging Croton or *Croton Tiglium* of Linnæus.

It is a remarkable circumstance, that all the published Engravings of the Plant are incorrect—and the Author has therefore annexed an accurate Drawing—which he trusts may not be unworthy the attention of the Profession. He begs to take this opportunity of acknowledging the kind and able assistance he has received from that distinguished botanist, Mr. Robert Brown.

It may be observed, that the Croton Tiglium Oil is the most powerful of all the cathartics mentioned in the Catalogue of the

Materia Medica, published by the Royal College of Physicians of London, always producing evacuation, unless there exists some mechanical obstruction. Medical practitioners doubt the certainty of its action, which is easily to be accounted for, from the numerous spurious compositions sold to the public, under the name of *Croton Tiglium* Oil, and which has cast an undeserved stigma on its reputation as a medicine.

It acts powerfully on the secretions of the liver, and the mucous membrane of the intestines.

Many cases of apoplexy have been relieved by besmearing the tongue with one or two drops of the oil, producing copious alvine evacuation, and thereby relieving the phrenitic inflammation.

The author will not say more in praise of this medicine, lest it may appear that he had an undue partiality towards it.

“ Est modus in rebus, sunt certi denique fines
Quos ultra, citraque nequit consistere rectum.

J. F.

Bridge Street, Blackfriars,

November, 1827.

OBSERVATIONS,

§c. §c.

*Vide London Medical Repository, Vol. 17,
page 461.*

It has been observed, with great truth, that “most of our new discoveries in the *Materia Medica*, have turned out to be no more than the revival and adaptations of ancient practices:” it becomes our duty, therefore, whenever a new medicine is introduced amongst us, to enquire into its history, and to discover, if possible, whether it has ever been popular in former times, or in other countries; and to learn from what cause it has fallen into neglect and disrepute.

The expressed oil of the seed of *Croton Tiglium* has lately excited much attention in this metropolis, on account of the peculiar properties which it possesses.

The first correct account we have of this

plant, is given in Jacob Bobart's* work, entitled *Plantarum Historia Oxoniensis Universalis*, published in the year 1649. His description is very explicit, and proves that he was well acquainted with the plant.

Bauhin, in his *Pinax Theatri Botanici*, (published 1671), mentions it; as also does Ray, in his *Historia Plantarum*, (published 1673); but the accounts in both these authors are not very perspicuous.

I shall shortly refer to extracts (relating to *Croton Tiglium*) from the works of celebrated authors, viz. Linnæus, Rumphius, Rheede, Loureiro, Bergius, and Fleming; all of whom agree with respect to the medicinal qualities of this plant.

Before I proceed upon the botanical description of this species of *Croton*, I beg leave to offer a few remarks on a recent publication, by Mr. Short,† that has been sent to the

* Jacob Bobart was principal gardener at Oxford. He died in the year 1679, aged eighty-one.

† In reprinting this observation I beg to observe that Mr. Short has, much to his credit, corrected the errors complained of, and I have had frequent occasions since to bear testimony to that gentleman's diligence and care in preparing the oil.

lecturers on *Materia Medica*, &c. This paper exhibits two errors, that are so remarkably prominent, that they cannot be passed over without a reprehension. The first is the term *Oil of Croton*; this is an indefinite and improper term.

Croton is a distinct Genus, and contains *eighty-two species*; and, consequently, according to Mr. Short's nomenclature, (which, I am sorry to say, has been too generally adopted) the name *Oil of Croton*, applies to *any* or the *whole* of the eighty-two species.

The second erroneous point, is the term *most safe*. There is do doubt, that the true oil of the seeds of the *Croton Tiglium*, in the dose of three or four drops, would destroy life; but, at the same time, one drop, administered by an experienced medical practitioner, in cases where its use was indicated, would be productive of great advantage; yet the term, *most safe*, cannot belong to so powerful a medicine.

The *Croton Tiglium** is a native of the

* The English term for *Croton Tiglium*, according to Mr. Aiton's *Epitome of the Hortus Kewensis*, is *purging Croton*.

island of Ceylon ; but it has also been found in Malabar, China, Cochin-china, and the Molucca Islands. It is a small tree, seldom exceeding the height of ten feet, and is covered with smooth bark, of a greyish colour. The root is much ramified ; the branches are spreading ; and the leaves pointed, serrated, nerved, alternate, and supported on long petioles. They are of an ovate figure, smooth, and of a dark green colour on their upper surfaces, and paler underneath. Both the male and female flowers are in racemes.

The male flowers consist each of cylindrical calyx, that is five toothed. The corolla is formed of five petals, of a straw colour. There are from ten to fifteen stamina.

In the female flowers, the calyx is many-cleft, and reflected under the germen. There is no corolla ; and there are three bifid styles.

The capsule is trilocular, ovate, coriaceous, and smooth. The partitions are very thin, almost membranaceous. Each loculus contains one seed. The seeds are convex on one side, and somewhat concave on the other : in point of colour, they vary from a light yellow

to a brown. This tree flowers in August and September.* It belongs to

Class 21.—Monœcia.

Order 8.—Monadelphia.

Species.—Croton Tiglium.

Natural Order.—Tricoccæ, Linnæus.

Natural Order.—Euphorbiæ, Jussieu.

SYNONYMA.

Ricinus Indicus, foliis subrotundis, &c.
Hist. Plant. Oxon. tom. ii. p. 349.

Pinus indica, nucleo purgante.—Bauh.
Pin. p. 492.

Cadel avenacu.—Rheed. Hort. Malab.
tom. ii. p. 61.

Granum Molluccum. — Rumph. Herb.
Amb. tom. ii. p. 98.

Ricinoides Indica, folio lucido, fructu glabro.
Burm. Fl. Zeyl. p. 200, tab. 90.

The seed has been called, Tilli Grana, Grana Mollucca, Grana Tiglia.

The seeds of this shrub, or the expressed oil of them, when taken internally, act as a very powerful hydragogue cathartic; and hypercatharsis is frequently produced. The

* The best drawings that have been made of Croton Tiglium, are in the possession of the Medico-Botanical Society.

truth of this circumstance is confirmed by all those authors who have written upon it, as well as by eminent practitioners of the present period.

The violent action which the oil produces, may be diminished by conjoining it with an aromatic, particularly any of the volatile oils; viz. *oleum caryophyllorum*, *cinnamoni*, *pimentæ*, &c.

Another mode of lessening its action, is, by roasting or baking the seeds, previous to obtaining the oil from them. The vegetable acids, (viz. acetous, tartaric, and citric,) have been stated to moderate the violent effect of the oil of the seeds of the purging *Croton*.

In cases where a very active cathartic is required, and where there are no symptoms to contraindicate its use, I have no doubt but the expressed oil of the *Semina Tiglii*, will be productive of advantage, if administered with due caution.

In maniacal cases, its use has been attended with success; and Sir George Tuthill, one of the physicians to Bethlem Hospital, found beneficial effects result from its employment.

Dr. Pearson informed me, that he had used

it in several cases with advantage. It has been asserted to have been useful in cases of tic douloureux; but I have not received a communication from any medical practitioner who had administered it in such cases.

I have seen instances in which the *Oleum Seminum Crotonis Tiglii* was applied to the tips of the fingers, for the purpose of ascertaining whether it produced any action. The result of the experiment was a sense of numbness in the fingers, hand, and arm, (but on local inflammation) dryness in the throat, thirst, and head-ach, which continued for several hours.*

When the oil is applied externally, it generally produces a great degree of local inflammation, which does not subside for many hours, and sometimes days.

The oil may be given in the dose of one drop, which, in particular cases, and under certain circumstances, can be augmented to

* The Oil of Tiglium, at present on sale, will not produce this effect, in consequence of the admixture of a great proportion of olive, or some other fixed oil. The oil used in the above experiment, was brought from Ceylon, and had not been in the hands of drug venders.

two. The following formula is a good mode of exhibiting it:

℞ *Olei Expressi Seminum Crotonis, Tiglii.*

Olei Caryophyllorum, ana guttam.

Confectionis Rosæ Gallicæ, gr. iv.

Misce, et sit pilula.

The natives of Ceylon, (particularly the poorer class of people) generally take one of the seeds for a dose. The wood of this shrub, which has been termed *lignum pavanæ seu panavæ*, acts, in moderate doses, as a diaphoretic; but, in large ones, as a hydragogue cathartic.

It appears, that no part of the *Croton Tiglium* has ever been inserted in the *Materia Medica* catalogue of any of the *British Pharmacopœia*, though it has in some foreign ones.

The *Semina Tiglii* are analogous in their operation, as well as in their form, to the seeds of the *Jatropha Multifida*, and the *Jatropha Curcas*. I understand, that some persons have stated, the *Grana Tiglia* and the *Semina Jatrophæ Curcadis*, to be synonymous terms. This opinion is a very incorrect one, and those persons who promulgated it, are

undoubtedly quite ignorant of the science of botany.

The following substances are similar in their operation to the *Oleum Seminum Tiglii*, viz. the oil of the external covering of the seeds of the *Ricinus Communis*, or Castor Oil plant; and the *Extractum Elaterii* Pharmacopœiæ Londinensis.

The *Oleum Seminum Tiglii* possesses all the characteristics of a fixed oil, e. g. is not miscible with water, and is converted into a saponaceous mass by means of an alkali.

The use of this oil is contraindicated in all cases where inflammatory action is going on; and there is no doubt, that much mischief arises from the administration of it, in any cases, if given by persons who are not thoroughly acquainted with its properties, dose, &c.

The remark of a well known author will justly apply, when this medicine is in the hands of an inexperienced medical practitioner: "*Medicamenta heroica in manu imperiti sunt uti gladius in dextra furiosi.*"

Having stated all the particulars I am ac-

* Also the expressed oil of the seed of *Argemone Mexicana*.

quainted with, respecting *Croton Tiglium*, I shall now proceed to call your attention to quotations on it, from the authors whose names I before mentioned; and I shall begin with the description given by the celebrated Linnæus, who was the greatest botanist that the page of history records.

As nearly all the quotations are (originally) in Latin, I have selected a few extracts for publication, and have rendered them into English, for the convenience of general readers.

1. "*Croton Tiglium*.—The leaves are ovate, smooth, pointed, and serrated; and it has a woody stem. Its properties are emetic, drastic, and burning."—Linnæi, *Materia Medica*, page 236.

2. "*Granum Molluccum*.*—Women who wish to get rid of their husbands, give them four grains at one dose. If the seeds are

* The name following the number, is that by which the *Croton Tiglium* is designated, in the works from which the extracts are taken.

thrown into ponds, they kill the fish.”—
Rumphius, Herb. Amboinense.

3. “*Cadel. Avenacu*.—The bruised leaves, taken in water, are purgative; and, if powdered and applied to the bite of the *cobra de capelle*, prove useful. One seed is taken as a purge.”—Rheede, Hortus Malabaricus, tom. ii. p. 62.

4. “*Croton Tiglium*.—The properties of the seeds are purgative, emetic, emmenagogue, and very acrid.”—Lour. Flor. Cochinchina, p. 582.

5. “*Grana Tiglii* are very rarely used by us, because they are too acrid. One of the seeds swallowed, purges sufficiently. A larger dose generally purges upwards and downwards.”—Berg. Mat. Med. vol. ii. p. 769.

6. “*Croton Tiglium*.—The seeds of this plant were formerly well known in Europe, under the names of Grana Tiglia, and Grana Molucca. They were employed as hydragogue purgatives; but on account of the vio-

lence of their operation, they have been long banished from modern practice.

For the same reason, they are seldom used by the Hindoo practitioners, though not unfrequently taken by the poorer classes of the natives. One seed is sufficient for a dose, being rubbed with a little rice gruel, or taken in a bit of plantain fruit."—Dr. Fleming, in Asiatic Researches, vol. ii.

For a more full account of the properties, &c. of *Croton Tiglium* I refer the reader to the following works, where a great deal of useful information will be found on this important plant:

- Plant. Hist. Oxon. Univ. tom. ii. p. 349.
- Rumph. Herb. Amb. tom. iv. p. 98, tab. 42.
- Rheede. Hort. Malab. tom. ii. p. 61.
- Burm. Flor. Zeyl. p. 200.
- Gærtner. de Sem. tom. ii. p. 119.
- Loureiro, Flor. Cochin. p. 582.
- Murray, Appar. Medicam. tom. iv. p. 150.
- Bergii Mat. Med. tom. ii. p. 786.

On the difference between the Genera Croton and Jatropha.—Vide Medical Repository, Vol. 18, page 474.

WHENEVER it happens that terms signifying things quite different from each other are regarded as synonymous, it becomes the duty of the botanist, as in the present instance, to rectify the error, by shewing that such names do not imply the same plant. It appears that *Croton Tiglium* and *Jatropha Curcas* have been regarded by some as synonymous; by others, the Genera *Croton* and *Jatropha* have been stated to be the same.

It certainly is true that the seeds of *all* the species of *Jatropha* yield, by expression, an oil that possesses strong cathartic properties, and requires to be exhibited in a small dose, but which of course must be regulated according to the age and strength of the patient, circumstances of the case, &c.

The *Semina Jatrophæ Curcadis* afford an expressed oil more purgative than any of the

other species of *Jatropha*; but this oil is not so purgative as the *Oleum Expressum Seminum Tiglii*, i. e. it requires a dose of about three drops to be equal in action to one drop of the true *Oleum Tiglii*, and it is probable that the activity of the oil of the seeds of all the species of *Jatropha* depends on a principle that may be termed *Jatrophin*.

Another circumstance to be remarked is, that there is no species of *Jatropha* found in the East Indies, of which country *Croton Tiglium* is a native. I have seen *Semina Jatrophæ Curcadis* labelled thus—"Semina *Crotonis Tiglii*;" and those persons who do not know the differences of the seed have supposed that the former were the latter.

I will give Linnæus' description of the two Genera:

CROTON. *Masculi flores* minores *femineis*.

Cal. *Perianthium* pentaphyllum: *foliolis* ovato oblongis, erectis.

Cor. *Petala* quibusdam quinque, vix calyce majora, oblonga, obtusa.

Nectarium glandulæ quinque, receptaculo affixæ parvæ.

Stam. *Filamenta* decem, vel quindecim, subulati, basi connexa longitudine floris.

Antheræ subrotundæ, didymæ.

Feminei flores a maritis remoti, in eâdem plantâ.

Cal. Perianthium ut in masculis.

Cor. Petala ut in masculis (quibusdam vix manifesta.)

Pist. Germen subrotundum, styli tres, reflexo-patentes, longitudine floris, semibifida. Stigmata reflexa, bifida.

Per. Capsula subrotunda, lateribus triloba, triloculares, loculis singulis bivalvibus, magnitudine calycis.

Sem. Solitaria, ovata magna.

JATROPHA. Masculi flores.

Cal. Perianthium vix manifestum.

Cor. Monopetala, hypocratriformis. Tubus brevissimus. Limbus quinque-partitus: laciniis subrotundis, patentibus, convexis, subtus concavis.

Stam. Filamenta decem, subulata, in medio approximata, quinque alterna breviora, erecta, corolla breviora. *Antheræ* subrotundæ, versatiles.

Feminei flores in eadem umbella masculis.

Cal. Nullus.

Cor. Pentapetala, rosacea.

Pist. Germen subrotundum, trisulcatum. Styli tres, dichotomi. Stigmata simplicia.

Per. Capsula subrotunda, tricocca, trilocularis: loculis bivalvibus.

Sem. Solitaria, subrotunda.

Having given Linnæus' description of the two genera, it will be easy for the reader to see the generic differences.

The seeds of *J. Cureas* are much larger than the seeds of *Croton Tiglium*, of a blackish cast and rough externally, about three-fourths of an inch in length, somewhat concave on one side, and convex on the other. The seeds of *Croton Tiglium* are about half the length, smooth, and of a yellowish brown colour externally, and they are somewhat concave on one side and convex on the other.

A few particulars with respect to some other species of *Jatropha* may be interesting.

J. Gossypifolia, or wild Cassada, native of West Indies.

J. integerrima, or entire leaved physic nut, native of Cuba.

J. multifida, or French physic nut, South America.

J. Panduræfolia, island of Cuba.

J. Manihot, or Cassava tree, South America.

J. Urens, Brazils.

Jatropha Manihot affords the cassada bread and flour of commerce, which is the fecula of its root, washed and dried. By its exsiccation it parts with an acrid principle which is volatile; in this respect the root of

J. Manihot resembles the root of *Arum Maculatum*.

The following is extracted from Lewis's Mat. Med. article *Ricinus*.

Ricinoides, seu pineus purgans, vel pinhones Indici, *Pharm. Paris*. Curcas, nux Barbadosensis, et faba purgatrix quibusdam; Ricinus Americanus major, semine nigro. C. B. *Jatropha curcas*, *Lin.* Barbadoes nut, with an oval walnut-like fruit, and oblong black seeds. *Vol. II. p. 271.*

Avellana purgatrix, C. B. Nuces purgantes, Ger, *Jatropha multifida*, *Linn.* purging nut, with oval fruit and roundish, somewhat triangular pale brownish seeds.—*Extr. Linnæi. M. M. Vol. II. p. 272.*

576 Croton Tiglium foliis ovatis glabris acuminati serratis, caule arboreo. *Loc. Zeylona. Pharm. Tiglii* (tilli) grana, gr. iij. *Qual. Acerrima. Vis. Emetica, drastica, exurens.*

578 *Jatropha curcas* foliis cordatis angulatis. *Loc. Brasilia, Jamaica. Pharm. Ricini, Majoris Semine,* Qual. Aris exurens. Vis. Drastica, inflammatoria.—Linn. Mat. Medica.*

* The *Ricini Majoris Semina* of the present day are quite different from the *Semina Jatrophæ Curcadis*, There appears to be some error with regard to the nomenclature made use of in this instance.

The reader will find some interesting matter concerning the various species of *Jatropha* in Gærtner's Work *De Seminibus*, Bergius's *Materia Medica*, Loureira's *Flora of Cochin China*, and Burman's *Flora Zeylanica*.

*Vide Journal of Science, Literature, and
the Arts, No. 33, page 59.*

PINHOEN OIL.

AN expressed oil has just been sent to me from the Brazils, under the name of *Pinhoen Oil*. It is used there as an emetic, and acts powerfully in the small dose of one or two drops.

It appears to be procured from the seed of a species of *Jatropha*, of which there are several indigenous to South America, most likely *J. Multifida*, the fruit of which has been long known under the name of the French Physic Nut. From some experiments which I made about two years since in the seeds of several species of *Jatropha*, I am inclined to think that there can be but little doubt of the plant which yields this emetic oil being of the genus first mentioned.

And it may here be remarked that the expressed oil of the seed of very many species all produce emetic and cathartic effects; the former attended by a sensation of heat about the fauces, and by doubling the dose drastic purgative effects ensue.

Mr. Reeves, of Canton, informed me that the varnish which the Chinese are so famous for making for covering paper boxes, tea chests, &c. is formed by boiling the expressed oil of the seeds of *Jatropha Curcas* with Oxide of Iron.

The seeds of *J. Curcas* have frequently been mistaken for those of *Croton Tigliuw*, *only* one can suppose from there being a degree of analogy between their effects, as there is none in point of appearance.

J. F.

Vide Journal of Science, Literature, and the Arts, No. 40, page 231.

IN a former number of this Journal some experiments appeared concerning the component parts of the oil as to inert and active matter, which induced me to repeat them, as well as to make some others which I purpose giving in detail. About five years ago, when the use of this oil was *revived*, (for it certainly was no new medicine), it attracted particular notice on the part of the medical profession, on account of the smallness of the dose (one drop) acting with such certainty as well as violence; indeed I have lately seen a case of Enteritis, in which it acted after enemata, colocynth, &c. had failed. It has been stated, with great truth, that *one* drop, merely applied to the tongue, will produce violent purgative effects.

It has been recommended to administer the oil in the form of a draught, by combining it with mucilage of gum arabic and mint water by some, and an alcoholic tincture by

others; both which modes of exhibition are in the highest degree objectionable, as they produce a great sensation of heat about the fauces, which can be traced by the patient throughout the alimentary canal, therefore the assertion of Linnæus,* in his *Materia Medica*, appears perfectly correct. The best manner of giving it is in the form of a pill, as by that means the unpleasant feeling about the throat is avoided. The tiglium seed oil which is on sale is frequently admixed with olive, castor, or rapeseed oil, which in a medical point of view is rather an advantage than otherwise, as it tends to moderate the violence of its action.

The genuine oil is so powerful as to produce death in the dose of a very few drops, but different samples vary in point of strength, which of course depends on the rate of active matter which they may contain. It is to be remarked that all those authors who have treated on it, have cautioned their readers

* Tiglii grana.

Qualitas, acerrima.

Vis, emetica, drastica, exurens.

Vide Linn. Mat. Med. p. 236.

concerning its use. Lewis, in his *Materia Medica*, has committed a strange error with regard to the dose. He says that *one drachm* must be the dose, and not a drop. We must, therefore, conclude that he was totally unacquainted with the article about which he was writing, as such a quantity would speedily terminate the life of the person to whom it might be administered. The plant is a native of the East Indies; it is a shrub seldom exceeding ten feet in height. It belongs to the twenty-first class *Monœcia*, and the eighth order *Monadelphica* of Linnæus, and to the natural order *Euphorbiæ* of Jussieu.

The male flowers consist each of a cylindrical calyx, which is five-toothed. The corolla consists of five petals of a straw colour, and there are from ten to fifteen stamina. In the female flowers the calyx is many cleft and reflected under the germen. There is no corolla, but there are three bifid styles. The capsule is trilocular and smooth; each loculus contains one seed. The seeds are somewhat concave on one side and convex on the other, and they are of a brownish yellow colour. The leaves are pointed,

nerved, serrated, supported on long petioles, and stand in alternate order.*

But to return to the object of this communication, I would observe, that I found that the expressed oil of the seed of this plant was entirely soluble in æther and the oil of turpentine, and partially so in alcohol. One hundred grains of the seed consisted of

32 shell

68 kernel

100

One hundred grains of the seed were digested in three drachms of sulphuric æther, sp. grav. 71, and afforded 25 grains of fixed oil.

Thirty grains of the oil were put into a Florence flask, containing some alcohol previously digested on olive oil, (as recommended in a former number of your journal) to prevent (as it is stated in the experiment alluded to) the spirit from dissolving any of the oil of the *Croton Tiglium* Seed. The mixture was now agitated, and then passed through a filter

* *Croton Tiglium* foliis ovatis, acuminate, serratis, basi biglandulosis petiolis, folio brevioribus, racemis terminalibus. — *Vide Linn. Spec. Plantar.*

containing carbonate of magnesia. The filtered solution was now evaporated without heat, and yielded

Active matter (soluble in alcohol and æther) combined with a very small portion

Of fixed oil - - 8.5 grs.

Inert fixed oil 23.5

32 grs.

It would appear from some experiments lately made in the manner above practised, that one hundred grains of the oil of the *Tiglium* seed afforded forty-five grains of active matter, but I must confess that I cannot find any sample of oil that will furnish so great a per centage. Now as Olive Oil is not by any means so soluble in alcohol as Castor Oil, incorrect results must ensue, in consequence of the alcohol not being fully saturated with a fixed oil prior to its mixture with the expressed oil of the seed of the *Croton Tiglium*. In order, therefore, to obviate this objection, I proceeded in the following manner, viz. Having saturated a given quantity of alcohol, of the sp. grav. of 840, distilled water being 1000, I digested in it 100 grains of the *Tiglium* seed oil, and

then, after having shaken the mixture, and allowed it to rest for a time, so that the *Tigliamentum* seed oil might precipitate, the supernatant liquor was poured off, and the oil weighed: the loss of weight, which was 21.5 grains, of course gives the rate per cent. of active matter to a nicety.*

It may now be stated, that out of nearly *ninety* species of the genus *croton* only *one* is purgative, which is that in question. I have examined the expressed oil of the seed of three species of *Jatropha*, viz. *J. multifida*, *J. Curcas*, and *J. Panduræfolia*; all these possess strong cathartic properties, which I have no doubt pervade the whole family. The fixed oil of the seed of these species had nearly the same chemical habitudes as that of the seed of *Croton Tigliamentum*. I have also found a similar principle existing in the seed of several species of *Ricinus*. The term *tigline* has been assigned by Dr. Paris to the active principle of the expressed oil of the seed of *Croton Tigliamentum*.

* I have never been able to obtain more than 32 per cent. of active principle in the best sample of the oil which I could procure.

Case of Phrenic Inflammation, in which benefit (by Metastasis?) was derived from Croton Tiglium Oil.—Vide London Medical and Physical Journal, Vol. 58, Page 47.

(TO THE EDITOR.)

KNOWING the interest which you take in promoting medical science, I am induced to communicate, through the medium of your Journal, the following case. I am convinced of the importance of this subject, in which I have been engaged for several years. The subjoined case is one amongst many others wherein I have observed that the peculiar action of the expressed oil of the seed of *Croton Tiglium* on the throat and fauces has been attended with the best effects.

A robust plethoric gentleman was seized, about twelve days ago, with an attack of *Phrenitis*, to relieve which the usual anti-phlogistic method of treatment was adopted to the fullest extent: copious bleeding to the amount of fifty ounces, active cathartics of scammony, gamboge, and calomel in large

doses, together with the application of a solution of *muriate of ammonia and nitrate of potassa* to the head, were persevered in, without any diminution in the urgency of the symptoms, the pulse continuing upwards of 120 in a minute. An unfavourable prognosis only could be formed under such circumstances.

I administered one drop of the oil of *Croton Tiglium* seed,* which in ten minutes produced violent hypercatharsis, and in the course of eight hours the patient became gradually sensible, although furious mania had existed, without a moment's intermission, for upwards of two days. On recovering his reason he complained of very great difficulty of deglutition, which was evidently caused (on inspecting the throat and tonsils) by the Tiglium Oil, which certainly produces

* As much difference of opinion exists as to the activity of the Croton Tiglium seed oil generally sold, I think it right to say that I purchased that above referred to of Mr. Short, of Ratcliff Highway, whose son in law, Dr. Conwell, revived its use in this country in 1819; and to whom His Majesty was graciously pleased to grant his royal letters patent, for preparing and vending the above article.

an active inflammation *sui generis*. By the use of demulcents this increased action was subdued, and there was no return of the former symptoms. It is remarkable that on pouring out some of the oil in question, a drop happened to fall on one of the fingers of my right hand, which caused pain in the throat, together with a feeling of heat, which lasted for two or three hours.

From the foregoing case, it would appear that a metastasis of inflammation from the brain to the throat was speedily effected; and as the latter inflammation was artificial, it subsided when the stimulus was withdrawn.

I would here suggest an idea which may, perhaps, prove useful; it is that of besmearing the tonsils of a person labouring under *Hydrophobia* with a portion of this oil. Might not the symptoms be alleviated? and would not the spasmodic action be lessened, and the pharyngeal inflammation altered, by producing one of a different and peculiar kind? At any rate there is a possibility of advantage, and as the experiment has never been tried this suggestion must be useful.

The active principle of the expressed,

oil of the seed of *Croton Tiglium* is entirely soluble in ether and oil of turpentine, and partially so in alcohol and proof spirit. I hope shortly to lay before the public some experiments, which will prove the existence of this peculiar principle in some other genera of plants, which I trust may not be unworthy the attention of the medical profession.

London, 18th May, 1827.

Remarks on a New Acrid Principle pervading several Genera of Plants.

It is a matter of great importance in science, to trace the analogy which exists between its several branches, and to ascertain what degree of connection there is between one class of bodies and another. To elucidate this by examples, it may be observed, of what consequence was it not to prove, that diamond and carbon were the same principle, under different form and modification? What good did chemistry not derive from the brilliant discovery of Sir Humphry Davy, of metals being the bases of the alkaline earths; thereby proving the existence of a body, possessing *similar* chemical habitudes in *dissimilar* substances? Who can deny, that it is by the aid of comparative anatomy, that we can attain a knowledge of the different organs of which an animal is constituted; and that it is only by following the same course in regard to vegetables, that we obtain an insight into their organization; the products of which,

require the aid of the chemist to ascertain their properties. It has often been contended, that the great difficulties attendant on the chemical investigation of vegetables, has materially contributed to retard its progress; which has, therefore, been but slow, in comparison with that of minerals. The ultimate elements or constituents of all plants are much the same, with the exception of those belonging to the natural orders *Cruciata* and *Fungi*; which alone are said to contain *nitrogen*, in addition to *hydrogen*, *oxygen*, and *carbon*. Although I have lately ascertained that *nitrogen* also exists in some members of the natural order *Atriplices* of de Jussieu; but to proceed to those vegetable products, termed *proximate principles*, it has long been demonstrated, that *Strychnine* pervades every species of *Strychnos*, and some other genera; *Cinchonine* the *Condamineæ*. The following experiments will prove the existence of an acrid purgative principle in *one* species of *Croton* all the species of *Jatropha*, and *Ricinus*, and several species of *Euphorbia*; the latter, and three former, are referred in the artificial system to two different and distinct

classes. De Jussieu, in his admirable system, placed those genera in his natural order *Euphorbiaceæ*, from the *botanical habits*; and my observations tend to prove, that their *chemical* peculiarities equally entitle them to this association; and there is no doubt but the same connection may be found to pervade other families of plants.

Of the genus *Croton*, there are now upwards of one hundred species, in only *one* of which, as far as has been hitherto ascertained, (although it may be supposed that other species contain it) this acrid purgative principle is found. By submitting to pressure the ripe seeds of *Croton Tiglium*, a thick fixed oil is obtained, the specific gravity of which approaches to that of Olive Oil. It is entirely soluble in sulphuric æther, rectified oil of turpentine, and partially so in *alcohol* of the sp. gr. of 860, distilled water being 1000.

The seeds of *Jatropha multifida*, *J. Curcas*, and *J. Panduræfolia*, were pressed, and yielded a fixed oil, also soluble in æther, rectified oil of turpentine, and partially so in alcohol of the same specific gravity. The seeds

of several species of *Ricinus*, and *Euphorbia*, afforded an expressed oil, possessing precisely the same characters. These oils were then severally digested in *alcohol* of the above *specific gravity*, previously saturated with olive oil, in order to prevent any portion of the most fixed oil being dissolved in the *alcohol*. The seeds produced 25 per cent. of fixed oil on an average. A given portion of the *Croton Tiglium* Seed Oil was treated with a proportionate quantity of *alcohol*, prepared as above; the mixture was then slightly heated in a Florence flask, allowed to cool, afterwards triturated with *carbouate of soda*, again heated, strained, and treated with *alcohol*; water was added, which threw down a white amylaceous-looking substance, which was collected on a filter, and found to be highly acrid and purgative. The other oils underwent a similar process, and the same results were obtained. This precipitate was soluble in *alcohol*, the specific gravity of which, was not more than ,855, in *sulphuric æther*. Its solution did not redden litmus, or brown turmeric paper. From the foregoing, it would appear, that the opinion stated

in the beginning of this paper, was well founded, and borne out by experiment. I propose to call this principle *Jatrophine*, as it is found in a greater number of species of that genus, than of any other genera. I have not yet examined the fruit of the Manchineel Tree of the West Indies, the acridity of which is well known; and as it is one of the members of the natural order *Euphorbiaceæ*, it will most likely afford *Jatrophine*.

J. F.

THE END.