AMERICAN JOURNAL OF PHARMACY
Volume 60, #7, July, 1888

# Botanical Medicine Monographs and Sundry

## THE TREATMENT AND DISTILLATION OF PEPPERMINT PLANTS.[1]

By ALBERT M. TODD.

"It has been claimed that the herb peppermint, when freshly cut yields more oil than when dried. Is this so, and does the increased yield of oil compensate for the increased expense of shipping the fresh herb to the distiller?"

This question has long been a disputed one, and the discussions have attracted the interests of both scientists and manufacturers. That the importance of making a determination which would be satisfactory and final will be better understood, I will, before stating the results of my experiments, give a brief description of our novel industry, prefacing the description with the single remark that distillation is effected with threefold the rapidity from the dry rather than from the green plants.

There are now, [in 1888],[2] cultivated annually in the United States [almost wholly in the states of Michigan and New York], over twenty thousand tons of peppermint plants, yielding over one hundred and twenty thousand pounds of essential oil, thus requiring on the average the production and handling of about three hundred and fifty pounds of plants in the undried state for a single pound of the essential oil. There are now in America, about two hundred and fifty small distilleries, where the crude or natural oil is produced, each distiller distilling, besides his own crop, the plants of about ten neighboring growers on the average, making the number of persons engaged in the industry as principals over two thousand five hundred, beside a large number of workmen employed in the cultivation and distillation.

The distillers' charge for working up the plants of other growers, has by custom been based upon the number of pounds of oil obtained rather than upon the quantity of plants, the present rate in Michigan being twenty-five cents for each pound of essential oil. This custom is most satisfactory to the grower, as he pays only according to his receipts, but it will be seen that it is not equitable for the distiller unless the plants are well dried prior to distillation.

The manufacturing system may be briefly noticed as follows: the plants having been out when in full bloom, are drawn to the distilleries either with or without curing, according to the notion of the grower. The essential features of the distillery are, first,

1 Read before the New York State Pharmaceutical Association, June 1888; communicated by the Author.

2 NOTE.-During the past few years the consumption of peppermint has rapidly increased, so that statistics of production and distilleries now given, show a marked increase over those given in my former papers on analogous subjects, which may be found as follows: in the "Proceedings of the American Pharmaceutical Association" for 1886, page 121, and the "American Druggist" for September 1886, page 161.

a large boiler for the generation of steam; second, a pair of large wooden vats, about six feet in height and of equal maximum diameter, which are connected with the boiler by steam-pipes, which enter them at the bottom, [two vats being used so that one may be emptied and refilled while the other is running]; third, a condensing apparatus, which consists of a series of pipes coated with pure tin, either with or without the ordinary "worm" over which cold water is made to flow continuously, this condensing apparatus being connected with the top of the distilling vats at pleasure by a duplex or "changing valve" ; lastly, is the "receiver" in which the essential oil is collected, the ordinary form of which is a metallic vessel, about twelve inches in, diameter and three feet in height, from the bottom of which an exterior pipe leads to a height nearly equal with the body of the receiver. Recently I have constructed a much more efficient and elaborate receiver for rapidly separating essential oils both heavier and lighter than water; but as this paper is not intended as a technical treatise on apparatus, it will not be described here.

About three inches from the bottom of the distilling vats are placed "false bottoms," containing many perforations, underneath which the steam enters from the boiler. Upon this perforated false bottom is placed a strong iron hoop, having a diameter nearly equal with the vat and supplied with heavy cross-bars. Two pairs of strong chains are secured to this hoop, meeting at the top of the vat in a pair of rings, one of which is fastened on either side of the vat at the top while it is being filled. This apparatus, as will be seen, is for the purpose of drawing the charge from the vats after distillation.

The apparatus being in position, the plants are thrown in by a workman with an ordinary hay-fork, while two or three others are engaged in "tramping them down." After the vat is about one-third full, a small supply of steam is let in, which softens the plants and greatly assists in packing. When filled, the vat is closed with a steam-tight cover, and the other charge being now distilled, the entire amount of steam is turned on in the new one. The steam comes up through the perforations of the false bottom, and is diffused evenly through the plants. The oil is contained entirely in the minute cells of the leaves and blossoms. The action of the steam is two-fold; it softens the tissues of the cells and at the same time, by its heat, causes an expansion of the particles of oil, so that they burst forth from their miniature prisons, and are carried off with the current of steam. The steam, now charged with the essential oil, upon reaching the top escapes into the condensing apparatus, where it assumes the form of oil and water. Separation takes place in the receiver; the water, being heavier, sinks to the bottom, and is forced by the pressure from within, upward and out through the exterior pipe referred to. The oil collects on the top and is dipped off at pleasure.

As stated, distillation can be effected with three-fold the rapidity from the dry plants, for the effect of drying is to soften the plants, allowing a larger quantity to be used for a charge, while such large charge can also be distilled in one-half the time required for a smaller quantity of green plants. But many growers, fearing that a loss of oil results from drying, by diffusion in the atmosphere, cannot be prevailed upon to bring their plants to the distilleries other than in a green state. The extremes of difference I have noticed are as follows: From a charge of two thousand pounds of dry plants, well covered with leaves and blossoms, thoroughly dried, I have obtained twenty pounds of

oil in thirty minutes, an hourly rate of forty pounds of oil and two tons of plants. From a similar charge of very coarse plants, with few leaves and blossoms, distilled in the green state, less than two pounds were obtained, requiring one hour for their distillation.

Upon a clear day in September, in the middle of the day, two loads of plants were cut down side by side at the same time. Both loads were immediately raked up in the green state, containing all the natural juices of the plant, then drawn to the scales and weighed. One load was immediately distilled, the other load being spread upon the ground and dried for two days in the sun. At this time the plants had become freed from nearly every particle of moisture, the leaves being so dry and brittle as to break off quite readily in handling. This second load, which had thus been dried in the sun and open air, was now spread out in a loft and exposed to a further drying and the action of the atmosphere for a little over six months.

The first charge of peppermint, which was distilled in the green state, weighed 2332 lbs. and produced 6 lbs. 9 oz. of essential oil, being one pound of oil for each 355.35 lbs. of plants, or 0.2814 per cent. After the second load had been dried and exposed to the atmospheric action as stated, for a little over six months, it was taken from the loft and distilled. I would say here that all the oil in the peppermint, as indeed in most, if not all, essential oil plants, is obtained from the leaves and blossoms. However, in distilling, the yield was more than one. pound of essential oil for each 362.5 lbs. of original green plants, which slight loss (about two per cent. in the amount of essential oil), is certainly to be accounted for by the portion of leaves and blossoms which rattled off in the re-handlings. The charge of peppermint, which was thus fully dried, had shrunk 49.4 per cent. of its original weight.

It will thus be seen that although the plants are very aromatic both before and after cutting, there is no perceptible loss of the essential oil by a thorough drying of the plants prior to distillation, the oil being so tightly scaled in its little prison cells that a force greater than that existing in the atmosphere or the rays of the sun is necessary to free it. Indeed, I have noticed that the leaves which fall from the plants in dry seasons and remain upon the ground over winter, even though subjected to rains and snows as well, are often found months afterward to be so strong that one would hardly suppose that any of the strength had passed off. It is known though in practical experience that when the plants are once dried and subjected to rains, the water carries of a portion of the oil, acting in that respect as a slight distilling force.

It is not within the scope of the present article to treat of the chemical effect produced upon the oil by the action of the atmosphere, the tests of the oil, etc. Such determinations may be found by consulting the papers referred to in the note below. The principal results of the experiments recorded herein may be summarized as follows:

*First.*—In the treatment of peppermint and such other American essential oil plants as have been examined, no perceptible loss of the essential oil by diffusion in the atmosphere is occasioned by a thorough drying of the plants prior to distillation, in the open air at any ordinary temperatures.

*Second*.—When the drying of the plants is continued through many months, a slight oxidation of the oil in the leaf occurs through contact with the oxygen in the atmosphere, decreasing its solubility, and increasing its specific gravity; also raising its boiling point through the formation of a non-volatile and insoluble resinoid produced by oxidation.

*Third*.—A long exposure of the plants to atmospheric action prior to distillation, does not affect the crystallizing tendency of the essential oil, nor other of its physical tests except those noted, so far as investigated.

*Fourth*.—To obtain the best results, both as to the quality of essential oil and economy of transportation and distillation, the plants should be dried as thoroughly as possible without endangering the loss of the leaves in handling. Distillation should then take place as soon as convenient, to prevent the oxidation of the oil in the leaf by atmospheric action.

NOTE.-Since writing the above, I just notice a paper by Mr. Joseph Schrenk, in the *American Druggist* for June, 1888, which corroborates the determination given in the above paper. Speaking of the crystals in the leaves of plants which have been dried for fifty years, be says: "It is remarkable how long these crystals will remain in the dried leaves. Fragments from an herbarium specimen gathered in Europe, in 1827, contain them in as perfect a condition as leaves of plants collected quite recently."

## THE GENUS LUFFA.[3]

BY JOHN M. MAISCH.

During the last six or eight years the so-called *towel-gourd* has attracted some attention, and the fibrous tissue of the fruit is now found in a number of pharmacies, where it is sold under the names of *vegetable sponge*, *luffa-sponge*, or *wash-rag*. The plant from which this article is derived is indigenous to Upper Egypt and other parts of tropical Eastern Africa, and belongs to the cucurbitaceous genus Luffa which is confined to the tropics, and is botanically closely related to Momordica, the genus yielding the well-known balsam-apple of our gardens; but, while the ripe fruit of the latter is dehiscent in an irregular manner, that of the Luffa separates at maturity an operculum or lid, which is formed by a kind of disc upon which the floral organs were situated.

The plant is known as *Luffa aegyptiaca*, Miller, and formerly as *Momordica Luffa*, Linné. It grows to the length of 20 or 30 feet, and has an angular tough stem which climbs by means of long and strong spirally twisted tendrils. The alternate leaves are roundish in outline, with a heart-shaped base, and with the margin divided into five lobes. The flowers are rather large, the corolla of a yellow color; the staminate flowers in racemes; the pistillate flowers solitary, with an elongated ovary and a three-lobed stigma. The fruit attains a length of from 10 to 20 inches, is two or three inches thick, elliptic in shape, but thinner towards the base; of a green color, externally marked by ten blackish longitudinal lines and opens at the apex by a flattish conical lid. The

3 Read before the Pennsylvania Pharmaceutical Association, at Titusville, June 13.

numerous seeds are oval, or oval-oblong, nearly half an inch in length and one-quarter inch broad; flat, slightly margined at both ends and of a dull blackish color. The testa is finely reticulate, and near the hilum on each side marked with two short ridges forming an obtuse angle. The embryo is of' a greenish-white color and has an oily taste.

The part used is the net-work of fibres in the interior of the fruit. Strong fibrous bundles are found in the pericarp under each of the longitudinal black lines; similar bundles are also contained in the (normally) three placentas, which project from the pericarp toward the centre of' the fruit, are there divided each into two branches and curve back again to near the pericarp. These longitudinal fibres, with their anastomosing branches following the same direction, are located in the inner layer of the net-work, while other branches running transversely form a similar outer layer, and in the placentas are arranged in strata, between which the numerous seeds are securely imbedded. To obtain this interwoven fibrous tissue, the ripe fruit is either kept in a warm and damp place for several weeks until the softer parenchyma becomes rotten, when it is removed together with its mucilaginous contents by repeated washing with water; or, without allowing the fruit to undergo this softening process, an incision is made longitudinally through the outer layer of the ripe pericarp, and the soft tissue with contents is removed by soaking in water, pressing with the hands and repeated washing, during which manipulation the seeds are likewise discharged through the longitudinal channels between the fibrous web.

When dry, this net-work is of a yellowish or dingy-white color, and rather hard and rough, though flexible; it readily absorbs moisture, becoming soft, though retaining its firmness, and in a slightly damp condition may easily be compressed. It is not unlikely that in this state it may be found useful as a surgical appliance for the absorption of liquid discharges, and bandages made of it have been employed to some extent in Europe. This absorbing power, combined with great durability and a certain amount of elasticity, have led, in Germany, to the manufacture of *luffa soles*, which are claimed to be more useful and serviceable in cases of sweating feet than soles made of felt or other material, by completely absorbing the perspiration and still retaining between the meshes a thin layer of air; moreover, they may be readily cleaned by washing with soap and water. The properties mentioned have also caused the material to be made into saddle undercloths which take up the perspiration of the sweating animal.

In Egypt, where the plant has long been cultivated, the luffa sponge is used for straining liquids, for scouring and scrubbing, and as a flesh-brush for friction in certain skin diseases; since its introduction into the United States it is employed mainly as a bathing sponge and as a flesh-brush, for which purposes it is well adapted in consequence of its lightness, texture, durability and the ease with which it is cleaned.

The plant is readily raised from seeds and is a rapid grower; if germinated early, it will flower and ripen its fruit in the latitude of Philadelphia before the cool autumn weather sets in, a light sandy soil being apparently better adapted for securing its perfection than a heavy and rich soil. Full-grown fruits, not completely maturing before cool weather, may be ripened by keeping them in a warm room; but in this case the fibrous net-work will be more delicate in texture and less resistant to wear.

Being an annual of tropical origin, the plant will grow with little or no attention in the Southern States, where it is now raised to some extent as an arbor vine. But the vegetable sponge met with in our commerce is perhaps altogether imported from Europe, and, considering the low price at which it is sold here at retail, is probably of Egyptian, or at least Oriental, origin. It is imported uncut, or, in other words, in the same shape in which it exists in the fruit, and may be employed in this condition, more particularly as a bathing or washing sponge, since the outer layer is smoother and softer than the inner layer, which is harder and rougher from the, both longitudinal and transverse, direction of the fibres, and from the projection of the placental tissues; hence the inner side is more effective for friction.

While the fruit in its pulpy portion has mainly a mucilaginous, not very inviting taste, it is to some extent used as a food by the poor people of Eastern Africa. The fruit of *Luffa Petola*, Seringe, is eaten in China and in some of the East India islands, and of the East India species Roxburgh mentions *Luffa pentandra* and *L. acutangula* of which the unripe fruit is edible. The last named species is more widely distributed than any other of the same genus, being indigenous not only to Southern Asia, as far northward as Afghanistan, but likewise to the West Indies and to South America as far as Brazil. In the West Indies it is commonly known as strainer-vine, very likely in allusion to the use made of the fibrous frame-work of the fruit. A variety of this, or a closely allied species, is *Luffa amara* Roxburgh, which has also a cucumber-like fruit, about four inches in length and provided with ten sharp longitudinal ridges or angles. The entire plant has a very bitter taste, more particularly the leaves, which, according to Prof. Dymock, are used as an external application to sores in cattle. The fruit is cathartic and emetic, and in the form of powder is used as a snuff in jaundice, while the juice of the roasted young fruit is applied to the temples to cure headache.

*Luffa Bindaal*, Roxburgh is regarded in Northern India as a powerful remedy in dropsy, and *Luffa echinata*, Roxburgh, is stated by Dymock to be employed in India as a remedy for colic, for cholera and for snake bite, the bitter fibrous contents of the fruit, which is of the size of a nutmeg, being given in substance or in the form of infusion.

Bentham and Hooker recognize ten species of the genus Luffa, of which only one is indigenous to America. However, in addition to *Luffa acutangula*, mentioned above, several other American plants are at least closely related to the same genus. For instance, *Momordica operculata*, Linne, is regarded by Grisebach as a variety of *Momordica Charantia*, Linne, and is *Luffa operculata*, Cogniaux, and of other botanists; in Brazil it is known as *buchinha*, the fruit being used for its powerful hydragogue cathartic properties. (See AMER, JOUR. PHAR., 1830, p. 144, 1884, p. 623.)

The fruit of the Egyptian luffa was chemically examined by R. J. Weber (AMER. JOUR. PHAR., 1884, p. 7), who determined the presence of tannin, a little yellow coloring matter, a small quantity of bitter extractive, chlorophyll, and much bassorin-like mucilage. A chemical investigation of the bitter species of Luffa does not appear to have been made; but it is very likely that the bitter constituent represents the diuretic, cathartic and emetic properties, for which many plants of the order of Cucurbitaceae are noted.

# NOTES ON SOME OLD REMEDIES.[4]

By JOHN M. MAISCH.

It is well known that many remedies, being in the course of time replaced by others, fall into disuse, sometimes for a long period, until, through accident or from other causes, they again attract the attention of physicians and are released from obscurity, either to find an apparently permanent place among officinal drugs, or soon to be consigned again among the obsolete articles. Such reintroductions of old remedies are frequently heralded as new discoveries, and, in some cases, such a claim holds good for special therapeutic applications, or for the chemical and physiological investigation of the active constituents. In most cases it will be at least of interest, from time to time, to collect recent statements or observations on remedies which were used by our forefathers, and for this reason the following brief record of the recent use of more or less forgotten medicinal plants is made.

*Potentilla canadensis*, Linne, popularly known as cinquefoil, fivefinger or dry strawberry, and common in grassy places throughout a. great portion of North America, was employed over a hundred years ago as a vulnerary and as an astringent, in diarrhea and hemorrhages, both internally and as a gargle. More recently it was lauded in chronic catarrhs, in gonorrhea, and as a powerful sudorific (see AMER. JOUR. PHAR., 1875, p. 111); and during the past year (*Therap. Gaz.*, Aug., 1887), Dr. Sansom Pope, of South Carolina, stated it to be a reliable remedy for night-sweats, an infusion of the entire plant being taken ad libitum, and that it is in use among the negroes as a, domestic remedy.

*Capsella Bursa-pastoris*, Moench, is known as shepherd's purse, and has established itself in most countries as a weed in fields and in waste and grassy places. For a long time it was employed, boiled in red wine, as a styptic in hemorrhages of various kinds, a use which has recently been revived in Europe. Formerly it also enjoyed some reputation as a remedy for gonorrhea and for intermittent fever. Among its constituents are a little volatile oil, identical with that of black mustard, a little bitter extractive, some resinous matter, and bursic acid, the latter having been recently prepared by Bombelon as an amorphous mass, which appears to be a glucoside. An interesting paper by Prof. Dr. Husemann, giving the medical history of this plant, has been published in *Pharmaceutische Zeitung*, 1888, p. 151.

*Reseda luteola*, Linne, called dyer's weed or weld, is a native of Europe, and occasionally found growing spontaneously in the Atlantic states of North America. Both the bitter herb and the pungent root, the latter having a raddish-like odor, were formerly valued for their diuretic and sudorific properties. A notice in *Journal de Médecine de Paris*, Feb. 5, 1888, states that reseda has a great reputation among the people of Russia as a taenicide, a strong infusion of the dried flowers being used, followed by a dose of castor oil. The species not being given, it is uncertain whether the indigenous (in Russia) species mentioned above is intended, or whether the notice refers to the flowers of the North African species, *Reseda odorata*, the well-known mignonette, which is cultivated every where for its sweet perfume, and was

4 Read before the Pennsylvania Pharmaceutical Association at Titusville, June 13.

medicinally employed by the Romans (Plinius, lib. xxvii).

*Ribes nigrum*, Linne, the black currant of our gardens, is indigenous to Europe and Northern Asia. All parts of the shrub possess an unpleasant odor, and were formerly employed for their diuretic and sudorific properties, and were valued as an alexipharmic. While the fruit, owing to its repulsive odor, is not relished, its expressed juice, after being fermented and aromatized with nutmeg, cinnamon, and other spices, has a delicate odor and very pleasant taste. This liquor, which is known in France as *cassis*, contains about 22 per cent. of alcohol, and has recently been recommended by Ferd. Vigier (*Jour. de Méd. de Paris*, March 25, 1888, p. 520), as a vehicle for many unpleasant remedies: the following. formulas will illustrate its uses:

*Elixir of terpin*. Terpin 0.50 gm. (gr. 7 $^1/_2$); alcohol and glycerin, of each 6 gm. (1$^1/_2$ drachms); cassis 8 gm. (2 drachms); vanillin 0.005 gm. ($^1/_{13}$ gr.). Dose, a wine-glassful 3 or 4 times a day.

*Wine of cinchona*. Extract of cinchona 1 gm. (gr. xv), cassis 12 gm. (3 drachms); good wine 7 gm. Dose, a wine-glassful at each meal.

Cassis is also said to be well adapted for the preparation of elixirs of calumba, coca, chloral, etc.

Our indigenous black currant, *Ribes floridum*, L'Heritier, has the smell and flavor of the cultivated species, and while it is probably equally effective as the latter, its fruit could doubtless be used for making an aromatic wine similar to the French cassis.

*Cytisus Laburnum*, Linne, is indigenous to Southern Europe, and is cultivated as an ornamental shrub under the names of golden chain and bean-trefoil, the large pendulous racemes of golden-yellow flowers being very showy. The purgative and emetic properties of the leaves and seeds are known in Europe, and particularly the seeds have been to some extent employed in medicine. J. L. Prévost and Paul Binet have been studying, for some time, the physiological effects of the -flowers, the green fruit and the seed (*Jour. de Méd de Paris*, January, 1888, p. 48). The aqueous extract of the seed was found to be more effective than the alcoholic extract. They consider the drug to be a good emetic, acting rapidly and better by hypodermic injection than when administered internally; and state that in large doses, besides the emetic action, paralytic effects are produced closely resembling those following the use of curare.

Of medicinal plants not growing wild or under cultivation in the United States, the following may be mentioned as having attracted renewed attention recently:

*Humiria floribunda*, Martius, a tree indigenous to Brazil, yields a pale yellow balsamic exudation which is used there like copaiba, as a substitute for which it has been again suggested in Europe. *Humiria balsamifera*, Aublet, of Guiana, yields a reddish balsam and resin, with a storax-like odor, and employed like that balsam.

*Acalypha indica*, Linne, is used in India as an anthelmintic, a decoction of the leaves, to which a little garlic is added, being employed. The expressed juice of the plant, mixed with oil, has the reputation of being an excellent liniment in arthritic and

syphilitic affections.

*Acalypha betulina*, Retzius. The leaves have an agreeable odor, and are employed in dyspepsia and in cholera. Our indigenous species of Acalypha do not appear to have been used medicinally.

*Syzygium Tambolanum*, De Cand., the jambolana or jambul of tropical countries, was referred to in a paper read before this Association in 1882, (Proceedings, p. 155, Am. JOUR. PHAR., 1882, p. 351). It was recently reported by Dr. J. Munday (*Brit. Med. Jour.*), to be of service in diabetes, in greatly reducing the quantity of urine, though it does not seem to affect the percentage of sugar secreted. One seed is taken thrice daily; the diminution of urine takes place within two days.

*Schinus Molle*, Linne, is a large tree of South America; its bark, leaves, fruit and exudation are medicinally employed. The fruit, which was recently sent to the London market on speculation (*Phar. Jour. and Trans.*, Dec. 3, 1887), is of the size of a pea and is remarkable for the striking resemblance in flavor to a mixture of pepper and fennel, and also has a slight bitterness and acridity. It has been used with success in gonorrhea by Léotard (*Les nouv. Remèdes*, Nov. 27, 1887), and by E. Bertherand (*Jour. de Méd. de Paris*, March 4,1888), and is given in the form of confection, the fruit being deprived of its reddish pericarp, then finely powdered and mixed with a small quantity of syrup of gum, whereby the odor and taste are sufficiently masked. The powder may also be made into pills. The tonic effects of the schinus fruit give it a great superiority to cubebs.

*Hydrocotyle asiatica*, Linne, the Indian pennywort, has been studied physiologically and therapeutically by Dr. C. Daruty de Grandpré (*Les nouv. Remèdes* April 8, 1888). In small doses it acts as an energetic stimulant, its effects being chiefly directed to the cutaneous system; hence its usefulness in various skin diseases. In large doses it is narcotic, producing stupor, headache, and in some persons vertigo with a tendency to coma.

*Gymnemasylvestre*, R. Brown, a twining asclepiadaceous shrub, indigenous to India, is regarded there as a remedy against the poison of serpents. In a paper read before the Nilgherry Natural History Society, at Otacamund, David Hooper called attention to the curious property of the leaves upon the sense of taste. They are bitterish, astringent and acidulous. After chewing one or two of the leaves, the sweetness of sugar is not noticed, and quinine tastes like chalk. The effect seems to last for several hours, and is apparently due to gymnemic acid, which somewhat resembles chrysophanic acid. The taste of sour, saline and astringent substances is not materially altered.

*Embelia Ribes*, Burmann, belongs to the order Myrsinaceae, and grows in Silhet where the berries have long been used for the adulteration of black pepper which they closely resemble in appearance, and to some extent in flavor. Dymock, in his work on the Materia Medica of India, states that they are efficacious against tapeworm, and form the principal ingredient of several patent medicines. G. H. Harris confirms (*The Lancet*) their efficacy for the complaint stated. The remedy is given, powdered, in doses of two to three drachms with milk or with curds early in the morning, fasting,

and some hours later is followed with a purgative, like castor oil.

*Siegesbeckia orientalis*, Linne, order Compositae, is widely distributed throughout Southern and Eastern Asia, where the bitter balsamic herb enjoys a reputation in dysuria and other complaints of the urinary organs. Dr. J. Hutchinson, of Glasgow, reports (*Brit. Med. Jour.*) his success in different forms of ringworm with the internal use of a syrup, prepared from the expressed juice of the plant; a liniment composed of equal parts of tincture of siegesbeckia and glycerin was employed externally. The drug appears to act both as a stimulant and parasiticide.

Several of the remedies enumerated above seem to deserve closer study on the part of pharmacists and physicians. Very few, if any, of them are likely to be honored in the future by a place in our national Pharmacopoeia. Still, even this distinction may be supposed to be in waiting for a larger number, when it is remembered that in the last edition such previously discarded plants, like Calendula and Chelidonium, were again admitted.

---

**The Haya Poison**.—An arrow poison called Haya, has been examined for Messrs. Christy and Co., of London, by Dr. Lewin, of Berlin, and was found by him to consist of a substance identical with, or allied physiologically to erythrophloein, a substance which, he thinks, acts as a local anesthetic. But Tweedy, in a letter to the *Lancet* (February 4th, 1888, p. 249), denies that erythrophloein produces anesthesia, and Liebreich (*DeutscheMed.Wochenschrift*,. Feb. 16, 1888) casts doubt on the inferences which Lewin has drawn from his experiments. He considers that Haya is probably a form of serpent poison, and hence, as Lewin found, acts more powerfully when injected subcutaneously than when taken by the mouth. The erythrophloeum bark found in the poison, Liebreich thinks, is probably simply an impurity. Lewin says that a paper which is about to appear in *Virchow'sArchiv* will show many of Liebreich's objections to be groundless.—*Med. Chronicle*, March 1888.

## THE CARDAMOM PLANT[5]

The cardamom of commerce, *Elettaria Cardamomum*, a member of the natural order of Zingiberaceae, is indigenous to the forests of Malabar, where it is found growing wild at altitudes ranging from 1800 to 3500 feet above sea level. A moderate degree of shade and any amount of moisture are the climatal conditions most favorable for the plant's luxuriant growth.

If the shade be too profound, the stalks which spring from the rhizome will be but few in number, but if sunlight be moderately admitted they will increase amazingly, often exceeding seventy in number, but if exposed to sunshine for more than an hour or two daily, the plant languishes and eventually dies out. Each stalk throws out a scape, or peduncle, varying in length from $1^1/_2$ to $2^1/_2$ feet, on which the fruit is produced in the form of capsules, arranged in an alternate manner on each side of the shaft, at a distance of about $2^1/_2$ inches from each other. From the description of the plant above

5 From the *South India Observer*. Reprinted from the *Phar. Jour. and Trans.*, June 9, 1888, p. 1032.

given a large crop might be expected, but the result does not fulfill the expectation to the anticipated extent, as, owing to the large amount of moisture contained in the vegetable tissues of the cases which cover the grains, one pound of the green fruit reduces down to one quarter or sometimes one-fifth of a pound when fully dried.

In its natural climate and soil, a sandy loam devoid of clay, the plant begins to bear in the second and yields a full crop in the fourth year. My experience does not enable me to state precisely the yield of each tree. I think that the planter may consider himself fortunate if he succeeds in harvesting on the average one-quarter pound of dry cardamoms per tree in the total number of sixty trees which occupy an acre, in the fourth year, less a certain percentage of loss occasioned by rats, squirrels and snakes, all of which species of vermin evince a partiality for the fruit and are ever on the watch to pounce upon it the moment it becomes ripe; and this entails the necessity of great watchfulness on the part of the planter to forestall these marauders, and be in the happy position of that early bird which proverbially “gets the worm.” Each stalk, as it completes its functions in bringing its scape to maturity and becomes effete, is succeeded by another stalk, sprouting from the parent rhizome, which begins to bear in the course of a year; and in this order the growth proceeds with successive renovations, until the plant attains its ultimate span of existence, in the lapse of time; the extent or duration of which is not known to the writer.

Until Ceylon glutted the home markets, cardamom sold well, but they hardly fetch remunerative prices now, as the quotations have fallen from 5s. a lb. to 1s. 4d., and even less for the small kinds, of which there is a considerable proportion in all lots, and which sell for about 8d. per pound. The spontaneous way in which the plant was for a long, time supposed to be exclusively produced, viz., from the concussion of the ground occasioned by the fall of a large tree felled over it, was, if not a purely fanciful idea, probably a cunning one suggested by the interested motives of those who were the fortunate holders of the cardamom hills and habitats. Whether such an origin has any better foundation to rest upon than the mere imagination, it would be idle here to discuss as there is no question of the fact that cardamoms can be reared from seed sown in shaded nurseries in the ordinary way, or from the division of the rhizome into parts containing young shoots or eyes fit for development into them. The former is undoubtedly the quickest way of forming a plantation; although it must be admitted the seed is singularly slow in germinating, taking never less than three and often as many as five months before the little spikes show themselves above ground. Within a year from this time the plant will, with careful culture, have attained a sufficient size to be planted out into pits dug for their reception in the shade of the forest, suitably prepared by trenching and the thorough extirpation of root and branch of the brush-wood occupying the surface. The process cardamoms are put through, called “bleaching,” is a tedious one and, if left to agents, particularly costly. It is done by exposing them to the fumes of sulphur in closed receptacles, a process which has the effect of transforming their dingy grey into a delicate, pale straw color. This may be called one of the tricks of the trade, which, while perhaps it may not appreciably deteriorate or detract from the quality or flavor of the grains, captivates the public eye and secures a better price.

# JAMBUL.

By WILLIAM ELBORNE, F. L. S.

Assistant Lecturer In Materia Medica and Pharmacy In the Owens College.

The term "jambul," as now usually accepted, is understood to apply to the seeds of - *Eugenia Jambolana*, Lam. (*Syzygium Jambolanum*, DC.), a tree attaining a height of from 70 to 80 feet, belonging to the natural order Myrtaceae, and, like others of the genus Eugenia, is for the most part a native of tropical America, the West Indies and of the East. In India the bark, leaves and fruit of this tree are used in medicine; the seeds in the form of powder are at present being recommended in this country as a remedy in diabetes.

The bark when fresh is of a gray or pale brown color, with a somewhat fissured and scabrous surface. Its section is pale white, soft, brittle and full of starch-like granules. Its juice is rather sticky, with an acidulous and astringent taste and acidulous smell. According to Dymock, a description apparently applying to the bark in the dried state, “the bark is gray and fissured externally; internally it is red and fibrous; its minute structure is remarkable in having several rows of very large pitted oblong oval cells, which can easily be seen with the naked eye. The odor is like that of oak bark, and the taste very astringent” It is used in the preparation of astringent decoctions, gargles and washes.

The leaves differ from those of other myrtles in not being pellucid punctate ; they are shortly petiolate, 3 or 4 inches long, smooth, leathery, varying between oval and obovate oblong and between acuminate and very obtuse, the West Indian form being rounded at the apex. They have an aromatic odor and taste.

The fruit unless improved by cultivation is about the size and shape of an olive of a purple color and very astringent; within it is a thin white papery shell which encloses a large green kernel, also very astringent. The epidermis is smooth, shining and very thin, and can readily be removed by scratching; within it is the pulp of a dark reddish color. The seed when fresh is of a pinkish color, which becomes brown on drying. The rind of the fruit is said to contain the active principle (*Year-Book of Pharmacy*, 1886, p. 208). The powdered seeds are highly useful in diabetes (Khory's “Ind. Mat. Med.”)

The jambul operated upon in the following notes was presented to the Materia Medica Museum of the Owens College last year by Mr. Thomas Christy, of London. It consisted of the dried kernels of the seeds, which had been cut in half transversely, apparently to facilitate the process of drying. The ovoid pieces were about the size of large peas, of a dull earthy-brown color with a dry earthy fracture, resembling in appearance fragments of pale catechu ( *Uncaria Gambier*); odor slightly aromatic.

*Moisture*.—Ten grams reduced to a fine powder and exposed in a porcelain dish to the temperature of a water-bath until it ceased to lose weight lost 1.02 gr.=10.2 per cent.

*Ash*.—The dried residue from above, thoroughly incinerated in a platinum dish, left an ash weighing .25 gr.=2.5 per cent. upon the original substance.

*I. Petroleum Ether Extract.*—Twenty grams of the original substance reduced to fine powder was made up to 100 c.c. with petroleum ether and macerated for forty-eight hours with frequent agitation. The clear liquid was poured off and the residue thrown upon a filter, and filtration continued by the addition of fresh ether until the filtrate measured 100 cc. The latter was of a yellowish-green color, and 20 cc. evaporated upon a water-bath until free from the solvent gave a residue of .015 gr.= .37 per cent., consisting of chlorophyll and fat free from odor.

Experiments with other portions of the extract gave evidence of the presence of a mere trace of an exceedingly volatile oil, the odoriferous principle.

*II. Ether Extract*.—The seed residue from I., after being well washed with petroleum ether and dried by exposure to the air, was macerated with about 70 cc. of ether for forty-eight hours with frequent agitation. The clear liquid being poured off and the residue thrown upon a filter, filtration was continued with fresh ether until the filtrate measured 100 cc. of the latter, which was of a bright yellow color; 20 cc. upon evaporation left a dark colored resinous residue weighing, .014 gr.=.4 per cent.

The ether residue is perfectly soluble in alcohol, and partially in water. Extracted with water, the aqueous filtrate develops a dark color with potash, is precipitated by acetate of lead, yields an inky mixture with ferric and ferrous salts, is not precipitated by solution of gelatin, and after having been boiled with a little dilute sulphuric acid copiously reduces alkaline copper solution, reactions indicating the presence of gallic acid.

Further experiments showed that water dissolved from the waterbath dried extract an amount equivalent to 0.1 per cent.

*III. Alcohol Extract*.—The seed residue from II., washed with ,ether and dried, was exhausted with absolute alcohol according to .the above method, the finished product measuring 100 cc. Of the latter, 20 cc. evaporated to dryness yielded a brown residue of 0.035 gr. =0.8 per cent., which was perfectly soluble in water; the aqueous solution gave negative results with alkaloidal reagents, and towards others, results were obtained with lead acetate, ferric chloride, gelatin, and alkaline copper solution as in II., indicating the presence of the same body.

*IV*.—The seed residue from III., exhausted with water according to above method, and 20 cc. of the finished product evaporated to dryness on a water-bath, weighed 0.19 gr. =. 4.7 per. cent. The liquid extract was of a dark sherry color; 20 cc. mixed with twice the volume of absolute alcohol, set aside for twenty-four hours, filtered. and the residue left in the filter washed with a mixture of alcohol and water (two vols. to one) weighed 0.05 gr.=1.25 per cent. of albuminous matters. The filtrate was evaporated until free from alcohol, and shaken twice with an equal volume of acetic ether. The ethereal layers being removed and the ether distilled off, left a colored residue weighing 0.03 gr.= 0.75 per cent., consisting essentially of gallic acid.

According to the above, we arrive at the following proximate composition of jambul:

| | |
|---|---|
| Essential oil | a trace. |
| Chlorophyll and fat | 0·37 |
| Resin soluble in alcohol and ether | 0·30 |
| Gallic acid | 1·65 |
| Albumin | 1·25 |
| Colored extractive soluble in water | 2·70 |
| Moisture | 10·00 |
| Insoluble residue | 83·73 |
| | 100·00 |

I have to thank Mr. Harwood for services rendered in connection with this investigation.—*Phar. Journ. and Trans.*, May 5, 1888, p. 921.