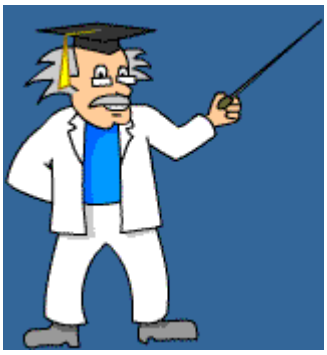

**Dr Z. loves Castor Oil. “Topically applied in the proper polymer it is one of the most important materials in the personal care market” he says. The following article from Botanical.com is a great review.**

**Happy Formulating!**

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Botanical.com
A Modern Herbal
by Mrs. M. Grieve

# Castor Oil Plant

**Botanical: Ricinus communis (LINN.)**
**Family: N.O. Euphorbiaceae**

**---Synonyms---Palma Christi. Castor Oil Bush.**
**---Part Used---Seeds.**
**---Habitat---By cultivation it has been distributed through not only all tropical and subtropical regions, but also in many of the temperate countries of the globe.**

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The valuable purgative known as Castor Oil is the fixed oil obtained from the seeds of the Castor Oil plant. Besides being used medicinally, the oil is also employed for lubricating purposes, burning and for leather dressing. The

Chinese are said to have some mode of depriving it of its medicinal properties so as to render it suitable for culinary purposes.

The Castor Oil plant is a native of India, where it bears several ancient Sanskrit names, the most ancient and most usual being *Eranda*, which has passed into several other Indian languages.

It is very variable in habit and appearance, the known varieties being very numerous, and having mostly been described as species. In the tropical latitudes most favourable to its growth, it becomes a tree 30 to 40 feet high; in the Azores and the warmer Mediterranean countries - Algeria, Egypt, Greece and the Riviera - it is of more slender growth, attaining an average height of only 10 to 15 feet, and farther north in France, and in this country, where it is cultivated as an ornamental plant on account of its large and beautiful foliage, it is merely a shrubby branched annual herb, rarely more than 4 to 5 feet high, with thick, hollow, herbaceous stems, which are cylindrical, smooth and shiny, with a purplish bloom in the upper part.

**---Description---**The handsome leaves are placed alternately on the stem, on long, curved, purplish foot-stalks, with drooping blades, generally 6 to 8 inches across, sometimes still larger, palmately cut for threefourths of their depth into seven to eleven lance-shaped, pointed, coarsely toothed segments. When fully expanded, they are of a blue-green colour, paler beneath and smooth; when young, they are red and shining.

The flowers are male and female on the same plant, and are produced on a clustered, oblong, terminal spike. The male flowers are placed on the under portion of the spike; they have no corolla, only a green calyx, deeply cut into three to five segments, enclosing numerous, much branched, yellow stamens. The female flowers occupy the upper part of the spike and have likewise no corolla. The three narrow segments of the calyx are, however, of a reddish colour, and the ovary in their centre is crowned by deeply-divided, carmine-red threads (styles). The fruit is a blunt, greenish, deeply-grooved capsule less than an inch long, covered with soft, yielding prickles in each of which a seed is developed. The seeds of the different cultivated varieties differ much in size and in external markings but average seeds are of an oval, laterally compressed form. The smaller, annual varieties yield small seeds- the tree forms, large seeds. They have a shining, marble-grey and brown, thick, leathery outer coat, within which is a thin, dark-coloured, brittle coat. A large, distinct, leafy embryo lies in the middle of a dense, oily tissue (endosperm). The seeds contain a toxic substance which make them actively poisonous, so much so that *three* large seeds have been known to kill an adult.

The following letter, taken from *The Chemist and Druggist* (February 19, 1921), corroborates the statement as to the 'toxic substance' in this plant:

**CASTOR-OIL SEEDS DANGER**

SIR, - On looking through my *C.* & *D.* I noticed your illustration of three ancient gentlemen "conferring at the Home Office as to whether Castor Oil should be put on the list of dangerous drugs," etc. Let me say that I think it very well might be, and I shall tell you why. In 1874, when I was in Squire's, Oxford Street, an assistant there was reading for his Minor examination, and as I had just come from Dr. Muter's school I used to bring up sometimes from the stockroom below samples of leaves, roots, seeds, etc., and show them to this assistant to see if he could tell what they were. One day I brought up some Castor Oil seeds, and asked if he knew what they were. He did not know, so I told him they were Castor Oil seeds . He said " I think it would be a good idea to make an emulsion of these and take it instead of the oil." I told him to shell them first, as there was a poisonous principle under the shell. He did so. I do not think he used more than six of the seeds, and when he had made the emulsion, which looked very nice, he drank it all. Within ten minutes he disappeared out of the shop unexpectedly, and an hour or two afterwards someone went up to his bedroom and found him Iying there unconscious. It was not then known what was wrong with him; but three West-End doctors near at hand were called in, and thinking he had taken some irritant poison they treated him with opiate injections, etc., as he had been severely purged and vomiting. I had gone off duty that afternoon at five o'clock, and when I came back at eleven there was considerable commotion among the assistants. They told me what had happened, and I was able to tell them exactly what the assistant had done, as until then they did not know. He lay for nearly a fortnight before he was able to resume work, and during that time he scarcely took any food, but one of the assistants made him jellies with gelatin and the juice of lemons and oranges, as well as other light articles of diet. I guess it - the emulsion - had acted very much in the same way as a few drops of croton oil would have done had it been made into an emulsion - as an irritant poison. I therefore think some caution is needed in dealing with Castor Oil seeds, if not particularly with the oil itself. On old-fashioned Castor Oil bottles the labels stated that it was "cold-drawn" oil. This, no doubt, would be because if heat were used in expressing the oil some of the poisonous principle would be dissolved by it. The coarser varieties of Gstor Oil, I think, are all more active than the fine oils, and this may likely be due to some of the poisonous element being expressed by the greater pressure used in making the cruder oil. Perhaps this note may serve as a caution to someone else who might be tempted to try an emulsion of Castor Oil seeds.

Yours truly,

R. THOMSON

Elgin.

In the South of England the plant ripens its seeds in favourable situations, and it

has been known to come to maturity as far north as Christiania in Norway.

**---History---**It was known to Herodotus, who calls it *Kiki*, and states that it furnishes an oil much used by the Egyptians, in whose ancient tombs seeds of *Ricinus* are met with. At the period when Herodotus wrote (the fourth century B.C.), it would appear to have been already introduced into Greece, where it is cultivated to the present day under the same ancient name. The *Kikajon* of the Book of Jonah, rendered by the translators of the English Bible, 'gourd,' is believed to be the same plant. Kiki is also mentioned by Strabo as a production of Egypt, the oil from which is used for burning in lamps and for unguents. Theophrastus and Dioscorides, in the first century, describe the plant, Dioscorides giving an account of the process for extracting the oil and saying that it is not fit for food, but is used externally in medicine, and stating that the seeds are extremely purgative. Pliny, about the same time, also speaks of it as a drastic purgative.

We read of it being employed medicinally in Europe during the early Middle Ages: it is recorded that it was cultivated by Albertus Magnus, Bishop of Ratisbon, in the middle of the thirteenth century, but later it fell into disuse, though Gerard (1597) was familiar with it under the name of *Ricinus* or Kik: the oil, he says, is called *Oleum cicinum* and used externally in skin diseases. As a garden plant, it was well known in this country in the time of Turner (1551). In the eighteenth century, its cultivation in Europe as a medicinal plant had, however, practically ceased, and the small supplies of the seeds and oil required for European medicine were obtained from Jamaica. The name 'Castor' was indeed originally applied about this period to the plant in Jamaica, where it seems to have been called 'Agnus Castus,' though it bears no resemblance to the South European plant properly so called. The botanical name is from the Latin *Ricinus* (a dog-tick), from the form and markings of the seed.

**---Cultivation---**The various varieties of *Ricinus*, which are perennial in their nativecountries, are generally annuals in England, though sometimes they may be preserved through the winter.

Plants are readily grown from seed, which should be sown on a hot bed early in March. When the plants come up, each should be planted in a separate small pot, filled with light soil and plunged into a fresh hot bed. The young plants are kept under glass till early in June, when they are hardened and put out.

*Ricinus* (Bronze King) and *R. Africanus* are two good garden varieties for this country, which if given good soil and kept well supplied with water, grow to a large size and make a fine effect in the garden.

**---Preparation for Market---**The seeds are collected when ripe: as the capsules

dry, theyopen and discharge the seeds.

The oil is obtained from the seeds by two principal methods - *expression* and *decoction*. The latter process is largely used in India, where the oil on account of its cheapness and abundance, is extensively employed for illuminating, as well as for other domestic andmedicinal purposes.

The oil exported from Calcutta to Europe is prepared by shelling and crushing the seed between rollers. The crushed mass is then placed in hempen cloths and pressed in a screw or hydraulic press. The oil which exudes is mixed with water and heated till the water boils and the mucilaginous matter in the oil separates as a scum. It is next strained, then bleached in the sunlight and stored for exportation.

In France, the oil is obtained by macerating the bruised seeds in alcohol, but the process is expensive and the product inferior.

There are two modes of extracting the oil by *expression*: (1) without heat, when it is termed 'cold drawn Castor Oil,' this process being largely carried out in Italy, Marseilles, Belgium, Hull and London; (2) with heat, the process generally adopted in America.

Italian Castor Oil, which is of an excellent quality, is pressed from seeds grown chiefly in the neighbourhood of Verona and Legnago. Two varieties of *Ricinus* are cultivated in these localities, the black-seeded Egyptian and the red-seeded American, the latter yields the larger percentage, but the oil is not so pale in colour. All the Castor Oil pressed in Italy, however, is not pressed from Italian seed, but some seeds are imported from India into Italy - as also into this country.

In the north of Italy, the fresh seeds are alone used, and after they have been crushed and the seed coats very carefully removed with a winnowing machine and by hand, the blanched seeds are put into small hempen bags, which are arranged in superposed layers in a powerful hydraulic press, with a sheet of iron heated to 90 degrees F. between each layer, so as to enable the oil to flow readily, they are finally submitted to pressure in a room, which in the winter is heated to a temperature of about 70 degrees. The oil which first flows is of the finest quality, but an inferior oil is subsequently obtained by pressing the mass at a somewhat higher temperature. The peeled seeds yield about 40 per cent. of oil. After expression, the oil is usually bleached by exposure to sunlight or by chemical means.

In America, where the oil is obtained by expression with heat, the manufacture is conducted on an extensive scale in California. There the seeds are submitted to a dry heat in a furnace for an hour or so, by which they are softened and

prepared to part easily with their oil. They are then pressed in a large powerful screwpress, and the oily matter which flows out is mixed with an equal proportion of water, and boiled to purify it from mucilaginous and albuminous matter. After boiling about an hour, it is allowed to cool, the water is drawn off and the oil is transferred to zinc tanks or clarifiers capable of holding from 60 to 100 gallons. In these it stands about eight hours, bleaching in the sun, after which it is ready for storing. By this method, 100 lb. of good seeds yield about five gallons of pure oil.

Of these three varieties of extraction, the Italian or cold drawn is considered the best the East Indian, the poorest, as the mode of purifying by heating with water is considered very imperfect. The former owes its freedom from acridity and unpleasant taste partly to the removal of the seed coats before pressing, and partly to the low temperature used during the manufacture.

**---Constituents---**The seeds contain 50 per cent of the fixed oil, which is a viscid fluid, almost colourless when pure, possessing only a slight odour and mild, yet highly nauseous and disagreeable taste. Its specific gravity is high for an oil, being 0.96, a little less than that of water, and it dissolves freely in alcohol, ether and glacial acetic acid. It contains Palmitic and several other fatty acids, among which there is one - Ricinoleic acid - peculiar to itself. This occurs in combination with glycerine, constituting the greater part of the bulk of the oil. The oil is decomposed by the fat-splitting ferments of the intestinal canal liberating this irritant Ricinoleic acid, to which the purgative action is considered in all probablity to be due.

Both the seeds themselves and the cake left after the expression of the oil are violently purgative, a property which is due to the presence of the highly toxic albumin Ricin. The seeds are never employed in this country on account of their violent action. Ricin exhibits its highest toxicity when injected into the blood. It is of interest to note that the work upon which is based the whole science of Serum therapeutics was carried out by Ehrlich with Ricin. He found that by injecting gradually increasing doses, immunity was established, a condition which he attributed to the formation of an antibody and termed Antiricin.

**---Medicinal Action and Uses---**Castor Oil is regarded as one of the most valuable laxatives in medicine. It is of special service in temporary constipation and wherever a mild action is essential, and is extremely useful for children and the aged. It is used in cases of colic and acute diarrhoea due to slow digestion, but must not be employed in cases of chronic constipation, which it only aggravates whilst relieving the symptoms. It acts in about five hours, affecting the entire length of the bowel, but not increasing the flow of bile, except in very large doses. The mode of its action is unknown. The oil will purge when rubbed into the skin, or injected. It is also used for expelling worms, after other special

remedies have been administered.

The only serious objections to the use of Castor Oil are its flavour and the sickness often produced by it. The nauseous taste may be disguised by administering it covered by Lemon oil, Sassafras oil and other essential oils, or floating on Peppermint or Cinnamon water, or coffee, or shaken up with glycerine, or given in fresh or warmed milk, the dose varying from 1 to 4 teaspoonsful. Probably the best way, however, is to administer it in capsules. Small repeated doses may be given in the intestinal colic of children.

It may also be made into an emulsion with the yolk of an egg or mucilage; or with orange-wine or gin.

Castor Oil forms a clean, light-coloured soap, which dries and hardens well and is free from smell. It has been recommended for medicinal use. The inferior qualities of the oil are frequently employed in India for soap-making.

Externally, the oil has been recommended for various cutaneous complaints, such as ringworm, itch, etc. The fresh leaves are used by nursing mothers in the Canary Islands as an external application, to increase the flow of milk.

The oil varies much in activity - the East Indian is the more active, but the Italian has the least taste.

Castor Oil is an excellent solvent of pure alkaloids and such solutions of Atropine, Cocaine, etc., as are used in ophthalmic surgery. It is also dropped into the eye to remove the after-irritation caused by the removal of foreign bodies.

'Castor Oil is finding increasing uses in the industrial world. It figures largely in the manufacture of the artificial leather used in upholstery; it furnishes a colouring for butter, and from it is produced the so-called 'Turkey-red' oil used in the dyeing of cotton textures. It is an essential component in some artificial rubbers, in various descriptions of celluloid, and in the making of certain waterproof preparations, and one of the largest uses is in the manufacture of transparent soaps. It also furnishes sebacic acid which is employed in the manufacture of candles, and caprylic acid, which enters into the composition of varnishes, especially suitable for the polishing of high-class furniture and carriage bodies. One of its minor uses is in the manufacture of fly-papers.' - 'West India Committee Circular.' (*Quoted in The Chemist and Druggist*.)

'THE CLEANING OF PICTURES. Lecturing in London, on November 15, on the preservation and restoration of pictures, Professor A. P. Lawrie, while not prepared to give a final opinion as to the safest methods of cleaning, suggested that where alcohol was used Castor Oil should be laid on the surface with a soft

brush; and then a mixture of Castor Oil and alcohol dabbed on with a soft brush, and removed by diluting with turpentine and sopping up with a large dry brush. Where alcohol was not a sufficiently powerful solvent, copaiba balsam emulsified with ammonia might be used, a preparation of copaiba balsam thinned with a little turpentine being laid on first.' (*Chemist and Druggist*, November 25, 1922.)

Combined with citron ointment, it is used as a topical application in common leprosy.