

2. Such a magma unquestionably has therapeutic advantages in combining more readily with the arsenic.

3. By pouring the iron solution *into* the diluted milk of magnesia a more voluminous magma will be obtained than by the reverse as directed in the United States Pharmacopœia VIII.

4. Milk of magnesia if properly prepared is practically free from carbonate, while magnesium oxide always contains some carbonate, excepting when recently calcined.

In conclusion I beg the pharmacists to keep the two solutions on hand, side by side, in separate bottles, ready for immediate use. Very fortunately we are not called upon to dispense or administer this antidote very often, but when it does happen, for instance, during the summer when the water from the poison fly paper finds its way into the stomach, then every minute is precious. Last of all, it seems to me an actual necessity that the United States Pharmacopœia should contain other antidotes besides this one similar to the Netherlands Pharmacopœia. Every pharmacist knows that in cases of poisoning the public run to the nearest drug store and many lives would be saved by having a table of antidotes in the United States Pharmacopœia, a copy of which standard according to the law must be on hand in every pharmacy and drug store.

ADULTERATED CUBEBS.

E. M. HOLMES, F. L. S.

The difficulty that has recently occurred in connection with oil of cubebs is due to the admixture in varying quantity of a poisonous variety of cubebs known in Java as Rinoe badak, which is, unfortunately, regarded in that island as a form of the genuine drug. So far as general appearance is concerned, as well as internal structure, a close similarity obtains between the genuine and false; but as in other plants, such as in the bitter and sweet almond, or as in the bitter and sweet cassava, a poisonous variety may closely resemble a harmless one. There are, however, two characters by which this poisonous variety of cubebs may be recognized. These are that it possesses a distinct odor and flavor of mace, and that it gives a yellowish brown color when a fruit is crushed and strong sulphuric acid (specific gravity, 1.843) is dropped upon it on a white saucer. The genuine cubebs give a *rosy crimson color* under these circumstances in all its varieties, of which there are several, distinguished by microscopic characters.

The mace-like odor is most easily recognized if some of the cubebs are enclosed for a time in a bottle or tin canister. The sulphuric acid test should be applied to several different looking fruits picked out of any given sample, as the fruits are often mixed, and the amount of adulteration or admixture can only be estimated in this way.

The genuine cubeb fruits vary to a small degree in size and in external appearance, so that a summary of the characters thus presented may prove useful.

GENUINE CUBEBS:

	Fruit	Stalks
<i>Piper cubeba</i> var. <i>katoentjar</i>	m.m. long	m.m. long
(narrow leaf)	5	5
(broad leaf)	5	5
var. from Purwedjo	5	5
" " Kediri	5	6
" " Malang	4	5
var. <i>tjaroeloek</i>	4-5	9

All these varieties may be regarded as genuine cubebs, although they differ slightly from each other in microscopical characters. The var. *tjaroeloek*, which is the name given in Java to the long-stalked true cubebs, is generally mixed with the typical shorter-stalked form, and is only recognizable by the length of the stalk, as it also gives the crimson reaction like the others.

All the above varieties of *Piper cubeba* are recognized by their size, the characteristic flavor, and the regular length of stalk, which is uniform for each variety, and by the blackish color, with a trace of bluish tint.

FALSE CUBEBS.

Six of these belong to the genus *Piper*, and have the same structure as cubebs, but differ in size and microscopic characters. They are as follows:

	Fruit	Stalk
<i>Piper Cubeba</i> , var. <i>badak</i>	m.m. long	m.m. long
" <i>ribesioides</i> , Wall	5	5
" <i>crassipes</i> , Korth	5	7
" <i>lowong</i> , Blume	6	10-13
" <i>venosum</i> , C. D. Cr.	6	6¼
" <i>mollissimum</i> , Blume	6-7	12-14
	13	17

None of these false cubebs give the crimson coloration with sulphuric acid.

The var. *badak* has a greyish tint and a mace-like odor and taste. The *P. ribesioides* a brownish tint and but little pungency. The *P. crassipes* are larger, black, have a cajuput flavor and a bitter taste, and are depressed where the fruit joins the stalk, which is generally curved.

The *P. lowong* has a short stalk, flattened and curved at the free end. *P. venosum* has an oval shape, and a long stalk, and *P. mollissimum* is twice as large as ordinary cubebs; they are known as Keboe Cubebs in Java, and are rarely exported mixed with other cubebs. The *P. ribesioides* also come as a distinct importation from Perak, and are rarely mixed with the true cubebs. The other false cubebs are readily detected by being free from any stalk and having a different

character internally. In true cubebs the seed inside is formed of a solid mass with a minute embryo at the apex.

Three other false cubebs belong to other natural orders, and may be distinguished as follows:

1. *Tetranthera citrata*, one seed with two seed lobes.
2. *Bridelia tomentosa*, two-seeded.
3. *Rhamnus species*, three-seeded.

In *Tetranthera citrata* the embryo of the seed consists of two seed lobes, which fill the fruit, but easily separate, and have a lemony taste. In *Bridelia tomentosa*, the fruit is seen externally to consist of two cells, and when cut open each cell is seen to contain one seed. In *Rhamnus* the fruit is externally three-celled, and when cut open is seen to contain three small stones with a seed in each. These are collected in Java, and mixed with the genuine in scarce seasons. The false cubebs, except the rinoe badak, are not known to be poisonous.

The frequent rise in price of cubebs appears to be partly due not only to the occasional failure of the harvest, but to the fact that in new plantations it is not possible, until the plants have flowered, to distinguish between male or sterile, and female or fruit-bearing plants, and disappointment in this respect leads to the demolishing of the plantations and growing other produce instead of cubebs, and collecting wild cubebs such as the five kinds mentioned above, besides the Rinoe badak, which is included in the cultivated varieties. The adulteration with other fruits probably takes place when the crop is a poor one.

SUMMARY OF MICROSCOPIC CHARACTERS.

The following analysis of microscopic characters has been prepared by Mr. J. Small, Ph. C., and may be found of use to analysts who need exact data for legal or trade purposes. The species not easily distinguished by external appearance are here given:

I.—Cubebs giving red reaction with H_2SO_4 —

1. (a) *Rinoe katoentjar* (narrow leaf):

Stone cell of epicarp.—Average length 23.2 microns, greatest length 30.8 microns.

Stone cell of endocarp.—Two rows of isodiametric cells with large open lumen.

- (b) *Rinoe katoentjar* (broad leaf):—

Stone cells of epicarp.—Average length 30 microns, greatest length 46.2 microns. Average width of lumen 3 microns, greatest width 10 microns.

Sclerenchyma of endocarp.—One row of radically elongated cells. Average length 77 microns, greatest length 92.4 microns.

3. *Piper Cubeba* from Djokjokarta:

Sclerenchyma of endocarp.—One row of radically elongated cells. Average length 107.8 microns, greatest length 130.9 microns.

3. *Piper Cubeba* from Djokjokarta:

Hypodermis present.

Scattered stone cells in inner parenchyma in sections from lower half of fruit.

Stone cells of endocarp in one to two rows.

Inner row continuous, cells radially elongated, isodiametric.

Outer row interrupted; cells tangentially elongated.

4. *Piper Cubeba* from Kediri:

Scattered tangentially elongated cells in inner parenchyma.
Stone cells of endocarp in one or two rows.
Inner row continuous, cells radially elongated.
Outer row interrupted, cells isodiametric.

5. *Piper Cubeba* from Malang:

Stone cells of epicarp large with open lumen.
Inner layer of endocarp. (One row of isodiametric stone cells interrupted by thin-walled cells.)

II.—Cubebis giving brownish yellow reaction with H_2SO_4 —1. (a) *Rinoe badak*. Type 1:

Stone cells of epicarp.—Average length 30.8 microns, greatest length 46.2 microns. Average width of lumen 10 microns.

Scattered stone cells in inner parenchyma, in sections from lower half of fruit.

Stone cells of endocarp in one to three rows.

Inner row continuous, cells isodiametric; outer row interrupted, cells radially elongated.

(b) *Rinoe badak*, Type 2:

Stone cells of epicarp in one or two rows.

Average length 38.6 microns, greatest length 46.2 microns.

Average width of lumen 15.4 microns, greatest width 23.2 microns.

Stone cells of endocarp in one or two rows.

Inner row continuous, cells radially elongated.

Average length 107.8 microns, greatest length 123.2 microns.

Outer row much interrupted, cells isodiametric.

2. *Piper ribesioides*:

Groups of stone cells in outer parenchyma.

Lacunae in compressed tissue. Tangentially elongated cells in outer edge of lacunae.

Scattered stone cells in inner parenchyma in sections from lower half of fruit.

Stone cells of endocarp isodiametric and tangentially elongated in two to four rows.

3. Large, long-stalked False Cubebis (*Piper crassipes?*):

Groups of stone cells in outer parenchyma.

No lacunae.

Scattered stone cells in inner parenchyma in sections from lower half of fruit.

Stone cells of endocarp isodiametric or tangentially elongated in two to four rows.