

high percentages of Bombay mace, (as judged from the ethyl-ether extractive) giving refractive indices of 1.4300 or higher. It would hence appear that, while the existence of a refractive index below 1.4700, points to the presence of Bombay mace, the finding of a higher reading than this cannot be regarded as evidence of the absence of Bombay mace.

The most conclusive chemical evidence of this adulteration of mace appears to be afforded by the ethyl-ether extract. In the case of Bombay mace, the resins seem to be less readily dissolved by petroleic ether than the fats. When these last are removed by petroleic ether, the subsequent extraction by ethyl-ether gives a number which is highly characteristic. It may be that alcohol, on account of its great solvent power for resins, might take the place of ethyl-ether, and effect a saving of time. This point may be investigated later.

Investigatory work done by Mr. Valin, since the above was written, has demonstrated certain points of importance in regard to details of operating. These are briefly:

1. The inadvisability of drying the sample at 100°—110° C. before extracting the fat and resins. Such treatment tends to make the extraction difficult.
2. The extractive matter is difficult to dry to constant weight, and an exposure of from 24 to 48 hours at 110° C. is required.
3. Extraction with petroleic ether is not usually complete in less than 16 hours.
4. The use of alcohol instead of ethyl ether, gives a somewhat higher extractive; but shows less characteristic difference between genuine and Bombay mace than does ether. For this reason it is not recommended.

The report now placed in your hands deals with 175 samples of mace, which are classified as follows:

Samples of known origin	7
" essentially true mace	30
" mixed with true and wild mace	95
" variously adulterated	43
Total	175

Their study would appear to justify the following standards for mace.

1. True mace is the dried arillus of *Myristica fragrans* (Houttyn.) It contains not more than three (3) per cent. of total ash, and not more than half of one per cent. (0.5) of ash insoluble in hydrochloric acid. Its crude fiber content does not exceed seven (7) per cent.

After extraction with petroleic ether, the ethyl-ether extractive does not exceed five (5) per cent. The total extractive by both solvents, does not exceed thirty three (33) per cent.

2. Macassar mace is the dried arillus of *myristica argentea* (Warb.)

3. Bombay Mace, is the dried arillus of *myristica malabarica* (Lamarok.) This mace must not be present in admixture with true mace, upon the label, or other mark clearly declares its presence, and approximate percentage content.

It is recognized that the limited number of samples of certified origin included in this report, leaves much to be desired in the way of assured knowledge of the limits of variation which may obtain in different samples of the maces studied, where these are the production of different soils and localities. At the same time, I am convinced that no injustice will be done to importers by official adoption of the very liberal standards suggested; while a very much needed protection will thereby be afforded to the consumer.

I would respectfully recommend publication of this report as Bulletin No. 349.

I have the honour to be, Sir,

Your obedient servant,

A. MCGILL,

Chief Analyst.