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Myristica fragrans Houtt.(ချောတို့ပွိုလ်)

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Myristica fragrans* Houtt. (ခေတီပွိုလ်)*1. Scope**

This standard prescribes the specification and identification for quality criteria of *Myristica fragrans* Houtt. (ခေတီပွိုလ်) kernel to be used as a single agent or as an ingredient of the traditional medicine formulations.

2. Definition

Myristica fragrans Houtt. (Nutmeg) belongs to the family Myristicaceae; its kernel is used in Traditional Medicines.

3. Description**3.1. Macroscopic characteristics**

Ovoid-shaped fruit, externally brown or reddish brown, dark reddish brown pointed lines and reticulately marked with furrows. Internally light brown with longitudinal striation. Odour aromatic, warm and aromatic taste.

3.2. Microscopic characteristics

Transverse section of *Myristica fragrans* Houtt. kernel shows:

- The outer perisperm cells are radially flattened and have brownish contents. A few of the cells contain prismatic or disc-shaped crystals. The inner perisperm shows numerous extensive lamellae, corresponding to the furrows on the surface and penetrating into the endosperm.
- Ruminated endosperm are composed of parenchymatous cells with thin brown walls and oval oil cells and show in their outer part vascular strands composed of lignified vessels and large oil cells.
- The endosperm is composed of parenchymatous cells with thin brown cell walls and containing simple or 2-10 compounds starch grains,

globular or irregular in shape with a slit-like hilum. A few tannin cells, containing tannin and starch, occur scattered in the endosperm.

3.3. Characters of the powdered drug

Reddish brown powder, strong aromatic odour, astringent and warm taste. The diagnostic characters are:

- simple or compound globular or irregular-shaped starch grains with slit-like hilum
- parenchyma containing starch grains from endosperm layer

4. Specification

4.1. Physicochemical data

- Loss on drying at 105°C : Not more than 13.0 %
- Foreign matter : Not more than 1.0 %
- Total ash : Not more than 3.0 %
- Acid-insoluble ash : Not more than 0.2 %
- Ethanol soluble extract : Not less than 17.6 %
- Water soluble extract : Not less than 12.8 %

5. Identification

5.1. Phytochemical test

- A) In a test tube containing 0.5-1.0 mL of ethanol extract of sample, add 5-10 drops of hydrochloric acid followed by a small piece of magnesium ribbon. Boil solution for few minutes, pink colour is produced.
- B) Add 1 mL of concentrated sulphuric acid to 2 mL of chloroform extract of the sample from the side of the test tube. Red colour is produced in the chloroform layer.

5.2. TLC analysis

Extract 1 g of the powder sample in 5 mL of petroleum ether in a test tube by shaking for 30 minutes at room temperature and then filter and filtrate is used for chromatography.

- Application volume : 5 μ L
- Developing solvent system : Toluene : Ethyl acetate (97:3)
- Spray reagent : Vanillin - Sulphuric acid
- Stationary phase : Silica gel G (A & D are glass plates, B & C are aluminium sheets GF₂₅₄)

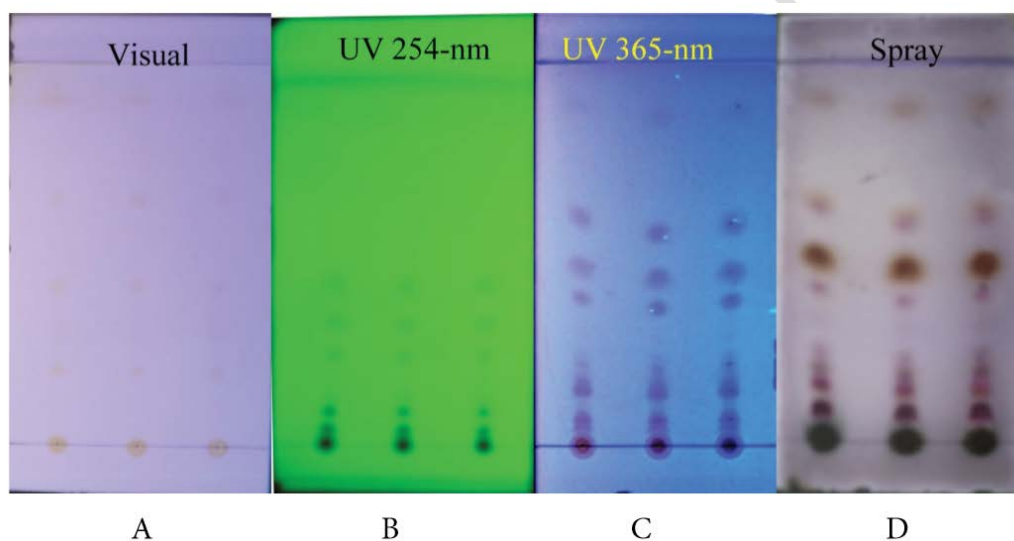


Fig.1. Thin-layer Chromatogram of petroleum ether extract of the kernel of *Myristica fragrans* Houtt.

Table 1. R_f values of components in petroleum ether extract of the kernel of *Myristica fragrans* Houtt.

R_f	Visual	UV 254 nm	UV 365 nm	Spray
0.88- 0.86	Pale yellow	-	Violet	Reddish brown
0.59- 0.56	Pale yellow	-	Violet	Yellow
0.45- 0.44	-	-	Violet	Reddish brown
0.38- 0.36	Pale yellow	Light brown	Violet	Purple
0.21	-	Light brown	-	Purple
0.18	-	Light brown	-	Reddish brown
0.14- 0.10	Pale yellow	-	Violet	Purple
0.06- 0.04	-	Violet	Violet	Brown

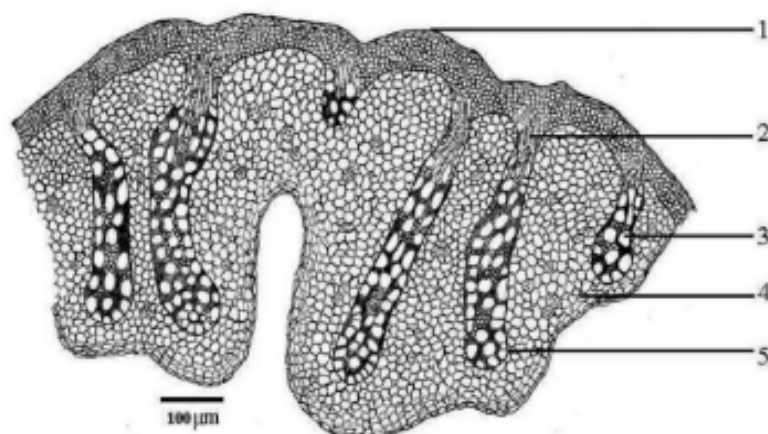


Fig.2. Transverse section of *Myristica fragrans* Houtt. kernel

1. Perisperm
2. Vessel
3. Oil cells
4. Endosperm
5. Ruminated endosperm

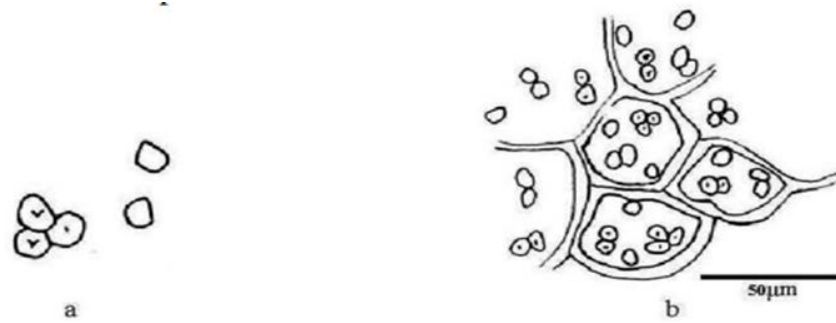


Fig.3. Characters of the powdered drug

- a. Simple or compound globular or irregular-shaped starch grains with slit-like hilum
- b. Parenchyma containing starch grains from endosperm layer

6. Reference

Department of Traditional Medicine, Ministry of Health. Myanmar Herbal Pharmacopoeia. VOLUME I. Nay Pyi Taw, Myanmar; 2013. Pg 67-71.