

Mesua ferrea* L. (ကုံကော်)*1. Scope**

This standard prescribes the specification and identification for quality criteria of *Mesua ferrea* L. (ကုံကော်) pollen grains and stamens powder to be used as a single agent or as an ingredient in the traditional medicine formulations.

2. Definition

Mesua ferrea L. (Cobra's saffron) belongs to the family Calophyllaceae; its pollen grains and stamens are used in Traditional Medicines.

3. Description**3.1. Macroscopic characteristics**

The androecium consists of many stamens; each stamen consists of an anther, connective and a filament; the anther lobe dithecous, linear, basifixed; each thecus consists of two anther sacs containing numerous granular pollen grains; the filament slender, filiform, curved and more or less twisted after anthesis. Odour fragrant and astringent taste.

3.2. Microscopic characteristics

Transverse section of *Mesua ferrea* L. an anther and a filament show:

Structure of an anther wall

- epidermis, one layer of flattened parenchyma, (the outermost layer) covered by unicellular, multicellular and uniseriate trichomes
- endothecium - cell layer radially elongated, beaded parenchyma, multilayer towards connective
- vascular strand contains annular to spiral vessels

- tapetum, innermost layer, 1- layer of parenchyma, some tapetal cells secrete nourishing substances
- pollen grains zonocolpate, oblate to suboblate, exine reticulate

Structure of a filament

- vascular bundle surrounded by a few layers of parenchymatous cell
- the outermost parenchymatous layers covered by thin cuticle layer with appressed hairs

3.3. Characters of the powdered drug

Golden yellow brown colour, characteristic and fragrant odour and astringent taste. The diagnostic characters are:

- fibrous layer of anther with pitted wall
- tricolpate pollen grains

4. Specification

4.1. Physicochemical data

- | | | |
|----------------------------|---|-----------------------|
| • Loss on drying at 105 °C | : | Not more than 5.54 % |
| • Foreign matter | : | Not more than 2.0 % |
| • Total ash | : | Not more than 3.6 % |
| • Acid-insoluble ash | : | Not more than 0.65 % |
| • Water soluble ash | : | Not less than 0.6 % |
| • Ethanol soluble extract | : | Not less than 38.08 % |
| • Water soluble extract | : | Not less than 34.2 % |

5. Identification

5.1. Phytochemical test

- A) A test tube containing 70% ethanolic extract of the drug is added 5-10 drops of dilute hydrochloric acid followed by a small pieces of magnesium ribbon. Boil solution for a few minutes, pink colour is formed.

- B) The aqueous extract of the drug is treated with 3 drops of ferric chloride solution. A deep blue colour is indicated.
- C) Two millilitres of aqueous extract of the sample is added to 1 mL of a mixture of equal part of Fehling's solution 'A' and Fehling's solution 'B' and boiled the contents of the test tube for few minutes. A brick red coloured precipitation is produced.

5.2. TLC analysis

Macerate 1 g of dried powdered sample in a stopper container with 5 mL of hexane and allow to stand for 24 hours. Use the filtrate for TLC investigation.

- Application volume : 5 μ L
- Developing solvent system : Hexane: Ethyl acetate (8:2)
- Stationary phase : Silica gel GF254 Aluminium sheet
- Spray reagent : Vanillin-sulphuric acid

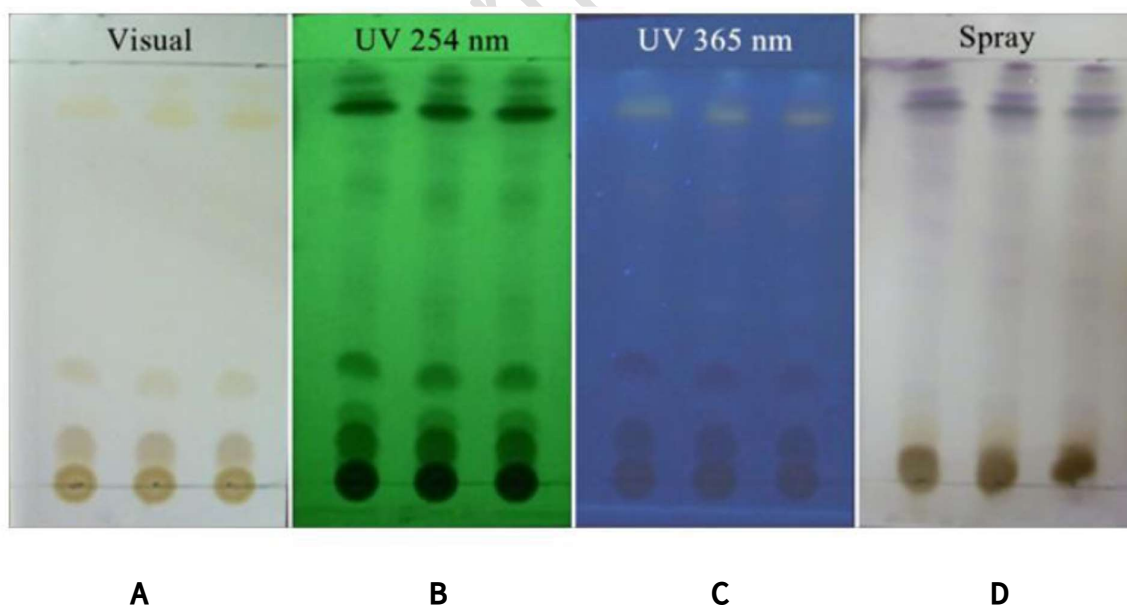
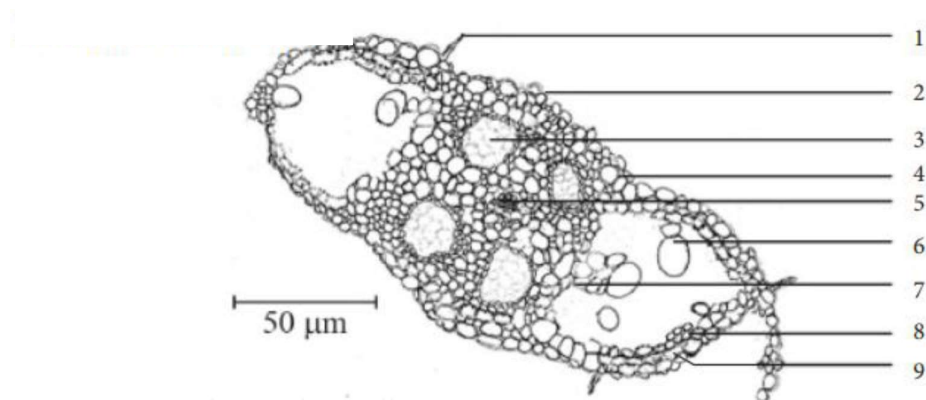


Fig.1. Thin-layer Chromatogram of Hexane Extract of the dried pollen grains and stamens of *Mesua ferrea* L.

Table.1. R_f values of components in Hexane Extract of the dried pollen grains and stamens of *Mesua ferrea* L.

R_f	Visual	UV 254 nm	UV 365 nm	Spray
0.98				Violet
0.96		Brown	Blue	
0.92	Yellow	Brown		Purple
0.87	Yellow	Dark brown	Yellow	Dark brown
0.85				Violet
0.78		Pale brown		Pale brown
0.67		Pale brown	Pale pink	Pale brown
0.50			Blue	
0.47				Pale brown
0.42			Blue	Pale brown
0.25	Yellow brown		Brown	
0.13				Pale yellow
0.08	Yellow brown		Brown	
0.03				Yellow brown

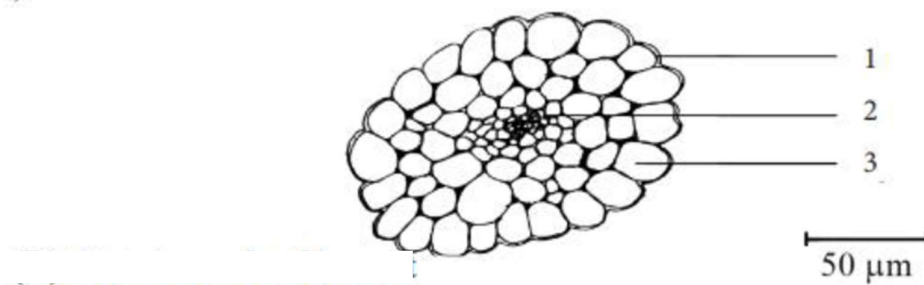


(A) Structure of an anther wall

Fig. 2. Transverse section of *Mesua ferrea* L. stamen

(A) Structure of an anther wall

1. Trichome
2. Cuticle
3. Resin ducts
4. Epidermal cell
5. Vascular bundle
6. Pollen grain
7. Tapetum
8. Fibrous layer of pollen sac
9. Endothelial cell



(B) Structure of a filament

Fig. 3. Transverse section of *Mesua ferrea* L. stamen

(B) Structure of a filament

1. Cuticle layer

2. Vascular bundle
3. Parenchyma cells

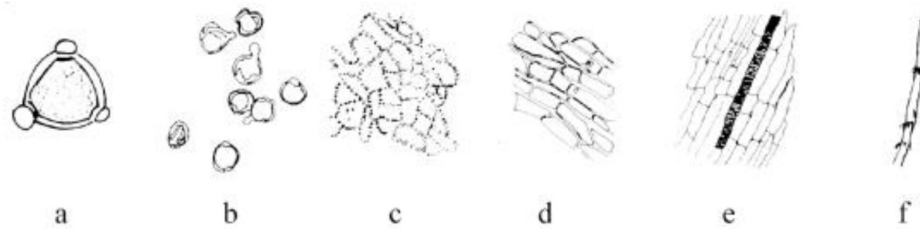


Fig.4. Characters of the powdered drug

- a. Tricolpate pollen grain
- b. Groups of pollen grain
- c. Fibrous layer of anther with pitted wall and oil globules
- d. Radially elongated parenchyma
- e. Vessel
- f. Trichome

6. Reference

Department of Traditional Medicine, Ministry of Health. Myanmar Herbal Pharmacopoeia. VOLUME II. Nay Pyi Taw, Myanmar; 2018. Pg 73-78.