Azadirachta indica A. Juss (တမာ)

1. Scope

This standard prescribes the specification and identification for quality criteria of *Azadirachta indica* A. Juss (တမာ) leaf powder to be used as a single agent or as an ingredient in the traditional medicine formulations.

2. Definition

Azadirachta indica A. Juss (Neem) belongs to the family Meliaceae; its leaf is used in Traditional Medicines.

3. Description

3.1. Macroscopic characteristics

Leaves compound, leaflets with oblique base, opposite, lanceolate, upper surface dark green, paler beneath, apex acute, margin serrate, characteristic odour and bitter taste.

3.2. Microscopic characteristics

Transverse section of *Azadirachta indica* A. Juss leaf shows:

- epidermis covered with cuticle, unicellular trichomes are present
- two layers of palisade cells below the upper epidermis
- spongy parenchyma composed of 5-6 layered thin-walled cells
- midrib region composed of several layers of collenchymatous cells
- anomocytic stomata present only on lower surface

3.3. Characters of the powdered drug

Greenish powder, characteristic odour, bitter taste. The diagnostic characters are:

- leaf fragment in sectional view
- upper epidermis in surface view

- unicellular trichome
- lower epidermis with anomocytic stomata and rosette calcium oxalate crystals

4. Specification

4.1. Physicochemical data

- Loss on drying at 105°C : Not more than 2.6 %
- Foreign matter : Not more than 9.67 %
- Total ash : Not more than 10.25 %
- Acid-insoluble ash : Not more than 0.7 %
- Ethanol soluble extract : Not more than 16.93 %
- Water soluble extract : Not more than 26.94 %

5. Identification

5.1. Phytochemical test

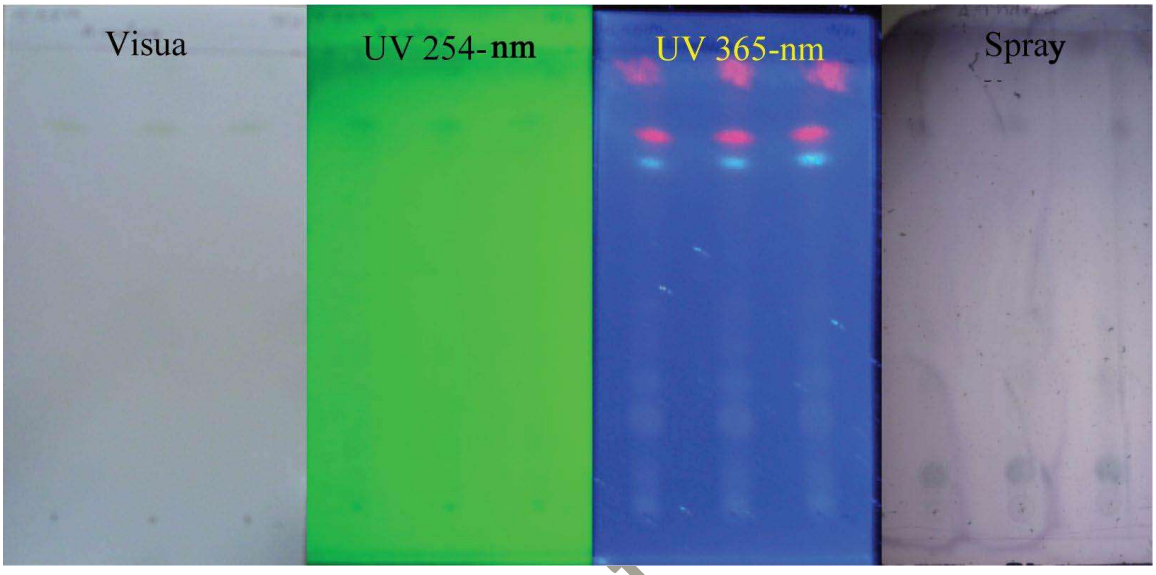
A) In a test tube containing 0.5-1.0 mL of ethanol extract of sample, add 5-10 drops of hydrochloric acid followed by a small piece of magnesium ribbon. Boil solution for a few minutes, red colour is produced.

B) Dissolve a small amount of aqueous extract of sample in 2 mL of distilled water, and add a few drops of 10 % aqueous ferric chloride solution. Blue colour is produced.

5.2. TLC analysis

Macerate 1 g of powder drug in 5 mL of methanol for three hours, filter and filtrate is used for chromatography.

- Application volume : 5 µL
- Developing solvent system : Toluene: Ethyl acetate: Formic acid: Methanol (3 : 3 : 0.8 : 0.2)
- Spray reagent : Anisaldehyde-sulphuric acid
- Stationary phase : Silica gel G (A & D are glass plates, B & C are aluminium sheets GF_{254})



A **B** **C** **D**

Fig.1. Thin-layer Chromatogram of Methanol Extract of the leaves of *Azadirachta indica* A. Juss

Table.1. R_f values of components in Methanol Extract of the leaves of *Azadirachta indica* A. Juss

R_f	Visual	UV 254 nm	UV 365 nm	Spray
0.92			Red	
0.82	Yellow	Yellow	Red	Violet
0.75			Greenish blue	Light blue

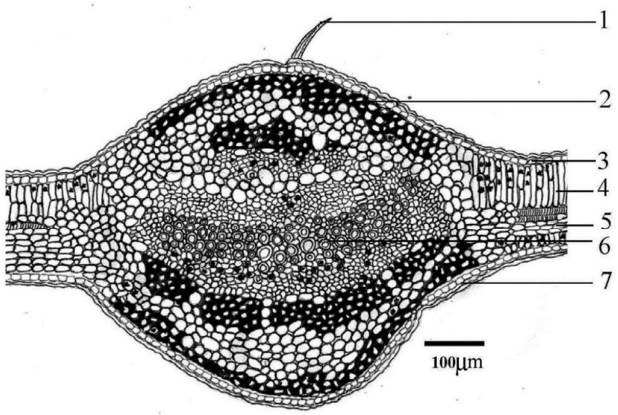


Fig.2. Transverse section of *Azadirachta indica* A. Juss leaf

1. Unicellular trichome
2. Collenchymatous cells
3. Upper epidermis
4. Palisade cells
5. Spongy parenchyma
6. Vascular bundles
7. Lower epidermis

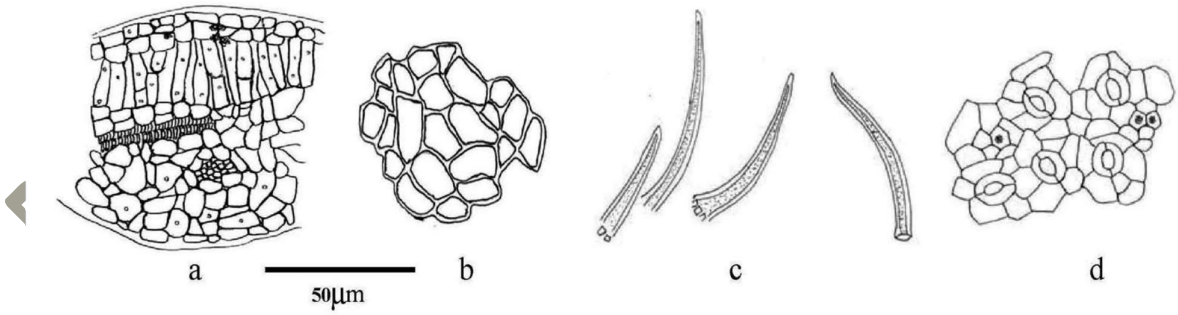


Fig.3. Characters of the powdered drug

a. Leaf fragment in sectional view
b. Upper epidermis in surface view
c. Unicellular trichome

d. Lower epidermis with anomocytic stomata and rosette calcium oxalate crystals

6. Reference

Department of Traditional Medicine, Ministry of Health. Myanmar Herbal Pharmacopoeia. VOLUME I. Nay Pyi Taw, Myanmar; 2013. Pg 62-65.