Moringa oleifera Lam. (ဒန့်သလွန်)

1. Scope

This standard prescribes the specification and identification for quality criteria of *Moringa oleifera* Lam. (ဒန့်သလွန်) stem bark powder to be used as a single agent or as an ingredient in the traditional medicine formulations.

2. Definition

Moringa oleifera Lam. (Horseradish, Drumstick) belongs to the family Moringaceae; its stem bark is used in Traditional Medicines.

3. Description

3.1. Macroscopic characteristics

Pieces of dried stem bark, outer surface dark brown with lenticels, inner surface light brown, corky with longitudinal fibres, adhering soft wood. Slightly characteristic odour, astringent and bitter taste.

3.2. Microscopic characteristics

Transverse section of *Moringa oleifera* Lam. bark shows:

- numerous layers of brownish cork consisting of rectangular tangentially flattened cells
- cortex layer composed of groups of sclereids and parenchymatous cells containing rosette calcium oxalate crystals, prismatic calcium oxalate crystals, oil globules and starch granules
- phloem consisting mainly of large patches phloem fibres and phloem parenchyma. Rosette and prismatic calcium oxalate crystals, oil globules and starch grains are also present in phloem parenchyma cells. Mucilagenous cavities found scattered, filled with mucilage. Phloem rays numerous and composed of elongated thin-walled cells

3.3. Characters of the powdered drug

Brownish powder, slightly characteristic odour, astringent and bitter taste. The diagnostic characters are:

- polygonal cork cells in surface view
- rectangular cork cells in sectional view
- stone cells
- rosette and prismatic crystals of calcium oxalate
- lignified fibres
- thin-walled parenchyma containing rosette calciulm oxalate crystals

4. Specification

4.1. Physicochemical data

- Loss on drying at 105°C : Not more than 9.1 %
 Foreign matter : Not more than 1.0 %
 Total ash : Not more than 8.2 %
- Acid-insoluble ash Not more than 0.7 %
- Ethanol soluble extract : Not less than 2.5 %
- Water soluble extract : Not less than 8.4 %

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, pale pink colour is produced.
- B) Dissolve a small amount of ethanol extract of sample in 5 mL of distilled water, add 2 M hydrochloric acid until an acid reaction occurs, then add 1 mL of Dragendorff's reagent, orange-red colour is produced.
- C) Dissolve a small amount of ethanol extract of sample in 1 mL of distilled water, add sodium hydroxide solution. Yellow colour is produced.

5.2. TLC analysis

Macerate 1 g of powder in 10 mL of dichloromethane for overnight, filter and filtrate is used for chromatography.

• Application volume : 10 µL Developing solvent system : Hexane: Ethyl acetate (8:2) • Analsaldehyde-sulphuric acid Spray reagent ٠ : • Stationary phase Silica gel G (A, D & E are glass : B & C are Aluminium sheets plates GF₂₅₄)



- Fig.1. Thin-layer Chromatogram of Dichloromethane Extract of the stem bark of *Moringa oleifera* Lam.
- Table.1. R_f values of components in Dichloromethane Extract of the stem bark of *Moringa oleifera* Lam.

R _f	Visual	UV 254 nm	UV 365 nm	After Spray visual	After spray 365
0.93				Violet	Violet
0.68-0.60		Faint yellow	Greenish	Violet	Pale yellow

		blue		
0.46		Pale yellow	Red	Orange
0.37		Pale yellow	Red	Red
0.22		Yellow	Yellow	Yellow



Fig.2. Transverse section of *Moringa oleifera* Lam. Bark

- 1. Cork
- 2. Rosette Calcium oxalate crystals
- 3. Oil globules
- 4. Stone cell

- 5. Phloem parenchyma
- 6. Fibre
- 7. Prismatic Calcium oxalate crystal
- 8. Mucilagenous cavity
- 9. Ray



Fig.3. Characters of the powdered drug

- a. Polygonal cork cells in surface view
- b. Rectangular cork cells in sectional view
- c. Stone cells
- d. Rosette and prismatic crystals of calcium oxalate
- e. Lignifed fibres
- f. Thin-walled parenchyma containing rosette calcium oxalate crystals

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6. Reference

Department of Traditional Medicine, Ministry of Health. Myanmar Herbal Pharmacopoeia. VOLUME I. Nay Pyi Taw, Myanmar; 2013. Pg 57-61.