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Tinospora cordifolia (Willd.) Miers ex Hook.f. & Thomson.

(ဆင်တုံးမနွယ်)

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Tinospora cordifolia* (Willd.) Miers ex Hook.f. & Thomson. (ဆင်တုံးမနွယ်)*1. Scope**

This standard prescribes the specification and identification for quality criteria of *Tinospora cordifolia* (Willd.) Miers ex Hook.f. & Thomson. (ဆင်တုံးမနွယ်) stem to be used as a single or as an ingredient of the traditional medicine formulations.

2. Definition

Tinospora cordifolia (Willd.) Miers ex Hook.f. & Thomson. (*Tinospora*) belongs to the family Menispermaceae; its stem is used in Traditional Medicines.

3. Description**3.1. Macroscopic characteristics**

Corky grooved stem. Young stem green, glabrous, older one with protuberances. Externally greenish brown to grayish, inner surface shows a radial structure medullary rays. Odour not characteristic, taste very bitter.

3.2. Microscopic characteristics

Transverse section of *Tinospora cordifolia* (Willd.) Miers ex Hook.f. & Thomson. stem shows:

- outermost cork layer composed of thick-walled brownish and compressed cells
- beneath the cork layer, cortex, a broad zone of parenchymatous cells containing sclereids and calcium oxalate crystals are present
- stele, composed of xylem and phloem . It occurs several bands from cortex to pith. The medullary ray is between the bands
- phloem consists of thick-walled fibres and phloem tissue

- xylem consists of large vessels, xylem fibres and xylem parenchymatous cells containing starch and various types of vessels. Such as annular, spiral, reticulate, pitted and bordered pitted
- pith composed of large thin-walled cells containing starch granules.

3.3. Characters of the powdered drug

Greenish brown powder, odour not characteristic, bitter taste. The diagnostic characters are:

- cork in surface view
- vessels
- various shape of sclereids

4. Specification

4.1. Physicochemical data

- Loss on drying at 105 °C : Not more than 7.92 %
- Foreign matter : Not more than 1.00 %
- Total ash : Not more than 7.75 %
- Acid-insoluble ash : Not more than 0.01 %
- Ethanol soluble extract : Not less than 8.25 %
- Water soluble extract : Not less than 8.50 %

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, red colour is produced.
- B) Shake vigorously 500 mg of the sample in powder, with 10 mL of water: a long lasting form is produced.

- C) Add 2 mL of acetic anhydride solution to 1 mL of petroleum ether extract of the sample in chloroform followed by 1 mL of concentrated sulphuric acid. Green colour is developed.
- D) Dissolve 1 g of alcoholic extract 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 colour is produced.

5.2. TLC analysis

Extract 1 g of powdered drug with 25 mL of methanol in a conical flask on water bath for 3 hours and filter. Evaporate until 2 mL of residue are left and use for chromatography.

- Application volume : 10 μ L
- Developing solvent system : Ethyl acetate: Methanol: Water (100:13.5:10)
- Spray reagent : Anisaldehyde-sulphuric acid
- Stationary phase : Silica gel G (A & D are glass plates, B & C are aluminium sheets GF₂₅₄)

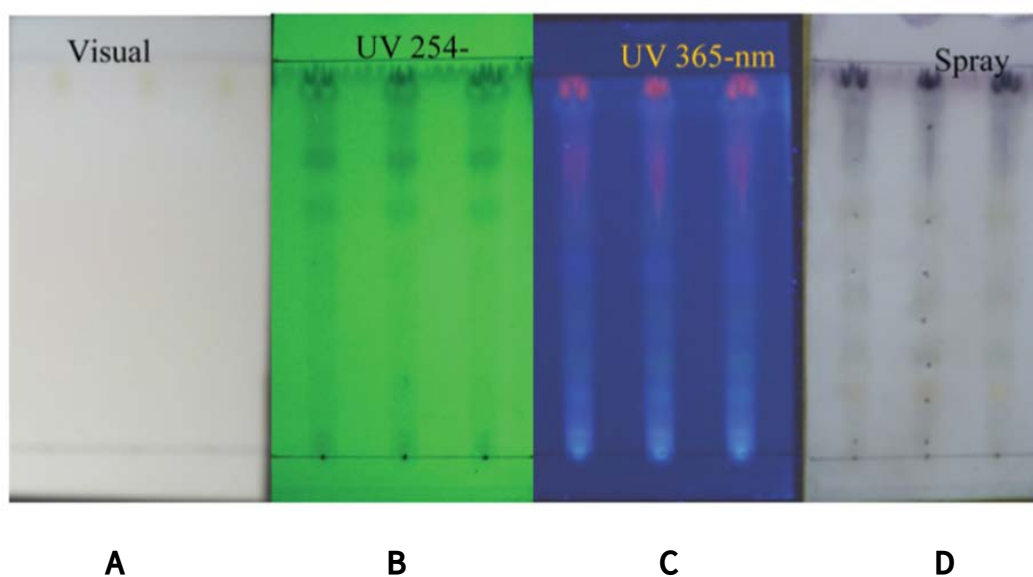


Fig.1. Thin-layer Chromatogram of methanol extract of the dried stem of *Tinospora cordifolia* (Willd.) Miers ex Hook.f. & Thomson.

Table.1. R_f values of components in methanol extract of the dried stem of *Tinospora cordifolia* (Willd.) Miers ex Hook.f. & Thomson.

R_f	Visual	UV 254 nm	UV 365 nm	Spray
0.85	-	-	Red	Violet
0.75	-	Brown	-	-
0.63- 0.61	-	Brown	-	Faint yellow
0.48	-	Brown	Faint blue	-
0.41- 0.35	-	-	Yellowish green	Faint green
0.26- 0.24	-	-	Yellowish green	Faint green

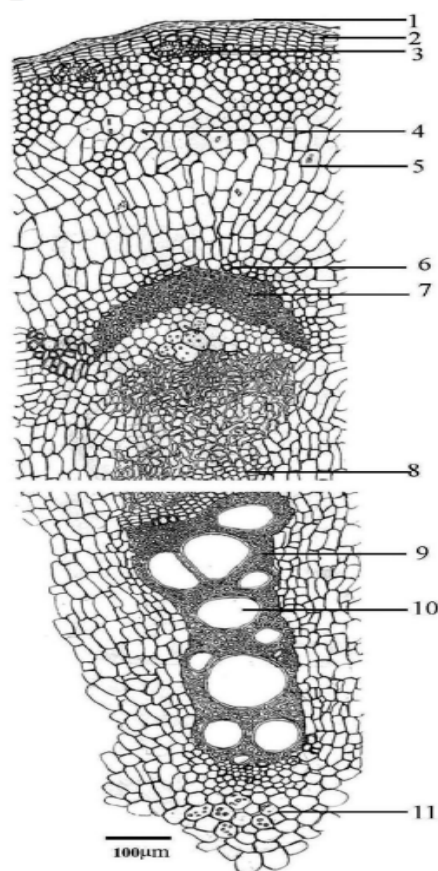


Fig.2. Transverse section of *Tinospora corifolia* (Willd.) Miers ex Hook.f. & Thomson. stem

1. Epidermis
2. Cork
3. Sclereids
4. Calcium oxalate crystals
5. Cortical parenchyma
6. Phloem
7. Fibres
8. Cambium
9. Xylem fibres
10. Vessel
11. Pith

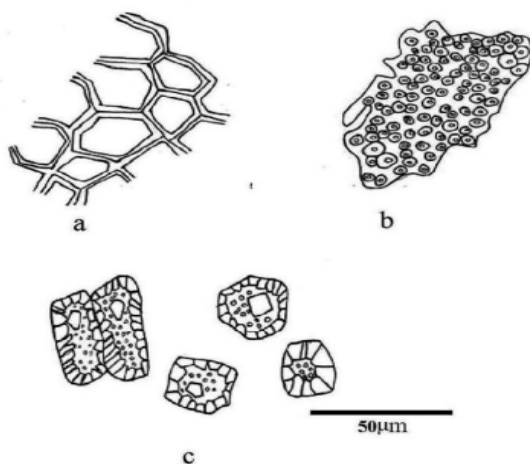


Fig.3. Characters of the powdered drug

- a. Cork in surface view
- b. Vessels
- c. Various shape of sclereids

6. Reference

Department of Traditional Medicine, Ministry of Health. Myanmar Herbal Pharmacopoeia. VOLUME I. Nay Pyi Taw, Myanmar; 2013. Pg 76-79.