

ส้มอพิเภก (SA-MAW PHI-PHEK)

Terminaliae Belliricae Fructus

Belleric Myrobalan

Category Laxative; carminative; astringent; expectorant.

Belleric Myrobalan is the dried mature fruit of *Terminalia bellirica* (Gaertner) Roxburgh (*T. belerica* Roxb.; *Myrobalanus bellirica* Gaertn.), DMSc Herbarium No. 92 and No. 171 (Family Combretaceae).

Constituents It contains tannins which are chebulagic acid, ellagic acid, gallic acid, etc. It also contains β -sitosterol and a green fixed oil.

Description of the plant Large tree, up to 50 m high, deciduous, up to 2 m in girth, usually with large buttresses; bark blackish, brittle, longitudinally fissured and cracked, thick, cut yellow. Leaves, coriaceous, obovate, 4 to 20 cm by 2 to 15 cm, glabrous; nerves widely spaced, 6 to 8 pairs; petiole glabrous, 3 to 9 cm long, usually with a pair of dotted glands at about the middle or near leaf-base, occasionally inconspicuous or hardly observed when dry. Inflorescences spike or raceme, 3 to 15 cm long, often crowded at ends of branchlets without leaves so as to form terminal panicles; flowers andromonoecious, male on the upper part, tomentose; calyx 1 to 2 mm long, 4 to 5 mm in diameter; calyx-segments recurved, deltoid, 1.5 mm long; stamens 3 to 3.5 mm long; ovary ellipsoid, 2 to 3.5 mm by 1.5 to 3 mm; style 4 mm long; disc densely, rusty villous. Fruits drupe, subglobose to broadly ellipsoid, 2 to 3.5 cm by 1.5 to 3 cm, slightly 5-ridged, densely velvety pubescent, very hard when dry. Seed 1, ellipsoid, rough, 1.2 cm by 0.5 cm (Figs. 1a, 1b).

Description Odour, indistinct; taste, bitter, acrid and astringent.

Macroscopical Subglobose to broadly ellipsoid, 2 to 3.5 cm long, 1.5 to 3 cm wide, slightly 5-ridged, the base extended as a short stalk, densely velvety brownish pubescent, very hard. One seed about 1.5 cm long and 1 cm wide, one edge more acute than the other, in the central part of hard endocarp (Fig. 1a).

Microscopical Transverse section of the fruit shows epicarp composed of a layer of thick-walled epidermal cells with unicellular trichomes. Mesocarp, 2 to 3 layers of collenchyma followed by a broad zone of parenchyma in which sclereids and stone cells, in group, and vascular bundles scattered, porous parenchyma; sclereids, various shapes and sizes, mostly elongated; tannins; prism and aggregate crystals of calcium oxalate in parenchyma. Endocarp consists of thick-walled sclereids of various shapes and sizes, mostly elongated. Sclereids, stone cells and vessels, lignified. Testa, one layer of large cubical cells, followed by a zone of reticulate parenchyma and vessels; tegmen consists of a zone of parenchyma and collapse parenchyma. Cotyledon folded and containing aleurone grains, oil globules and rosette aggregate crystals (Figs. 2a, 2b).



Fig. 1a *Terminalia bellirica* (Gaertn.) Roxb.
1. the plant ; 2. flowering twig ; 3. fruiting twig ; and 4. crude drug

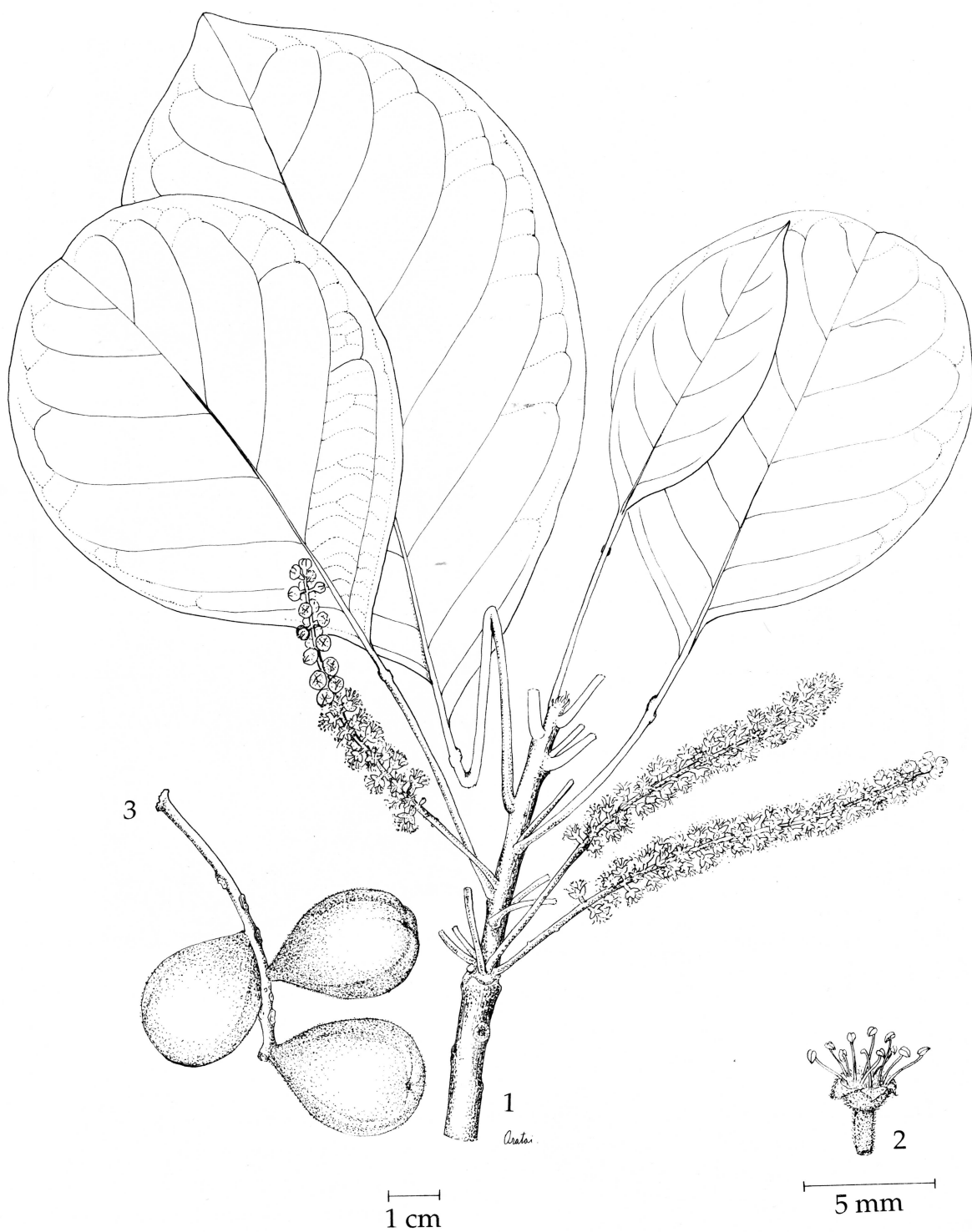


Fig. 1b *Terminalia bellirica* (Gaertn.) Roxb.
1. flowering twig ; 2. flower and 3. fruits

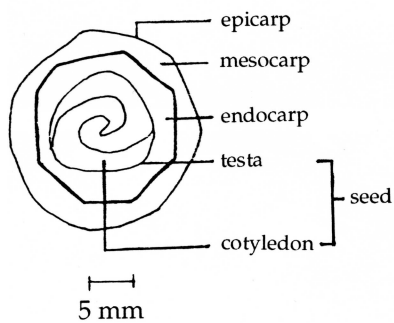


Diagram of the Fruit

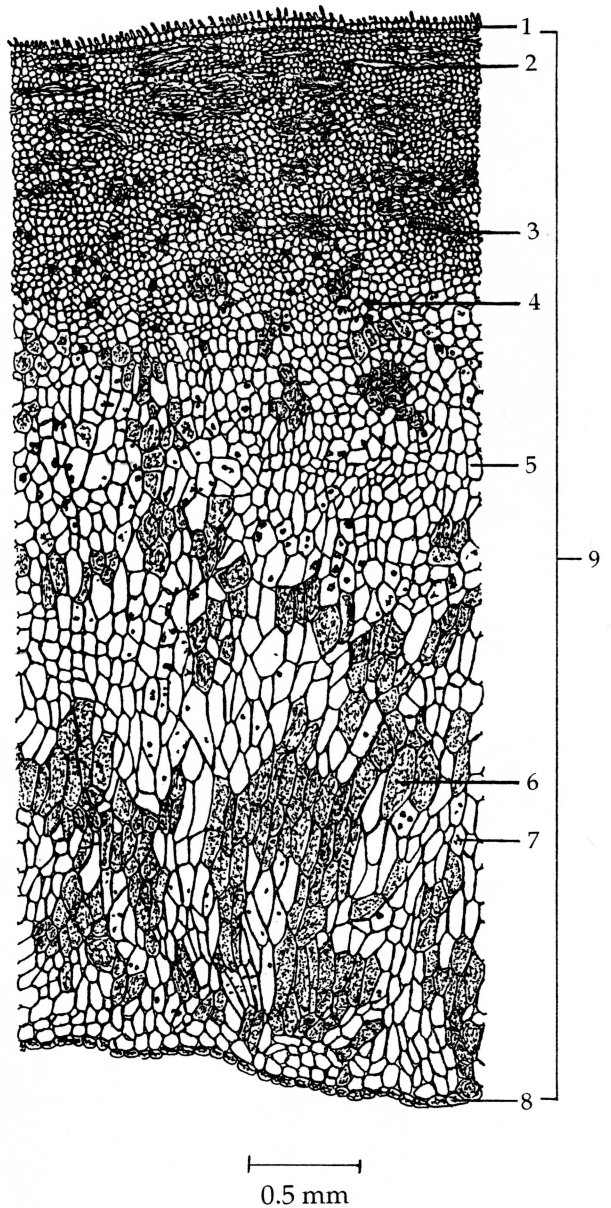


Fig. 2a Transverse Section of the Fruit Pulp of *Terminalia bellirica* (Gaertn.) Roxb.

- | | |
|--|-------------------------------------|
| 1. epidermis of epicarp with unicellular trichomes | 5. ground parenchyma |
| 2. sclereids | 6. porous parenchyma |
| 3. vascular bundle | 7. prism of calcium oxalate crystal |
| 4. brownish black mass | 8. sclerenchymatous endocarp |
| | 9. mesocarp |

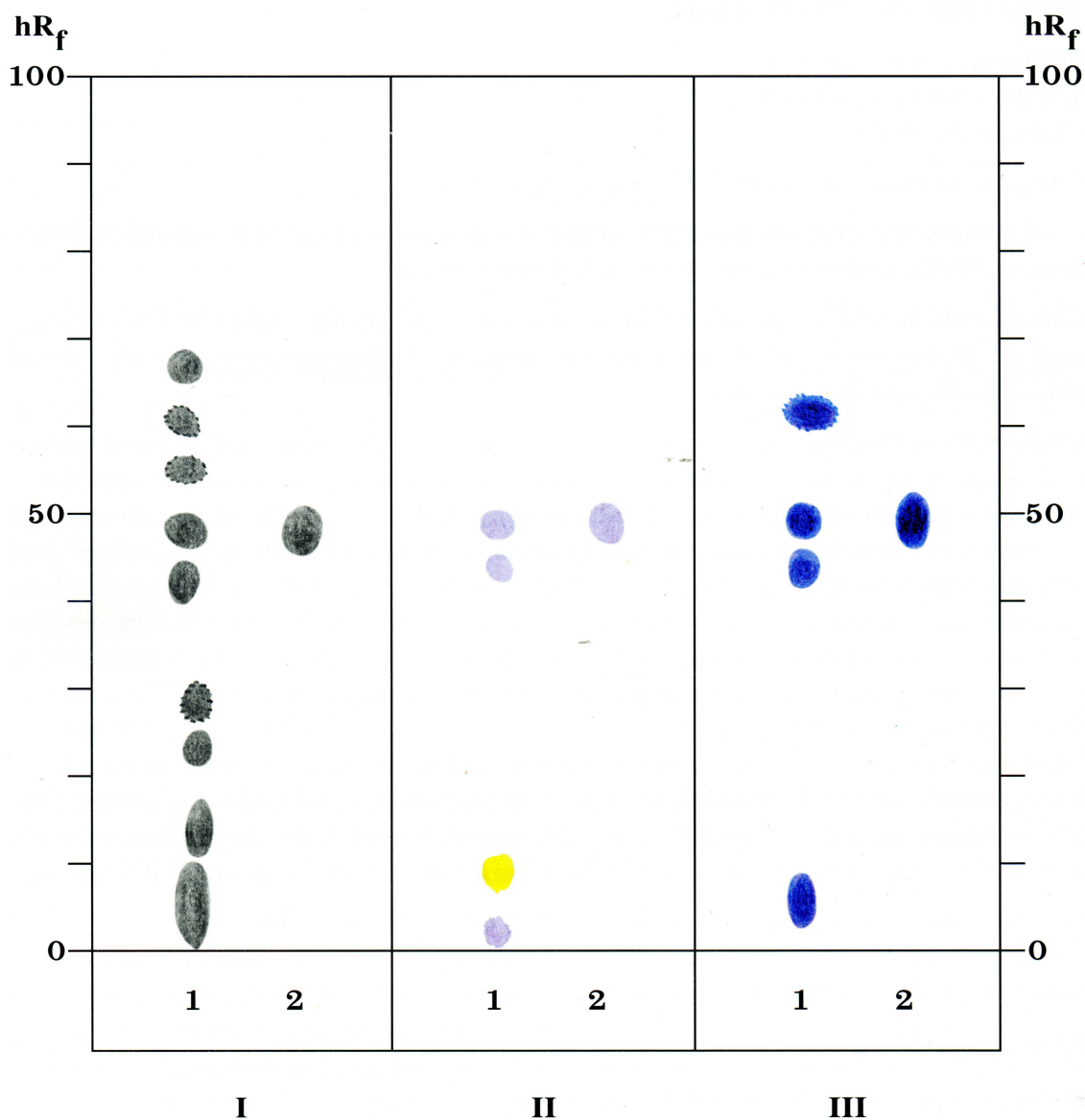


Fig. 3 Thin-layer Chromatogram of Water Extract of the Fruits of *Terminalia bellirica* (Gaertn.) Roxb.

- 1 = solution (A)
- 2 = solution (B)
- I = detection under UV light (254 nm)
- II = detection under UV light (366 nm) after spraying with *anisaldehyde* TS
- III = detection with *potassium hexacyanoferrate(III)* TS and *iron(III) chloride* TS
- = spots appear in some batches of the samples.