

DODONAEA HERBA

Definition

Dodonaea Herba consists of the fresh or dried flowering tops of *Dodonaea angustifolia* L.f. (Sapindaceae).

Synonyms

D. thunbergiana Radlk.
D. thunbergiana Radlk. var. *linearis* Sonder
D. viscosa Jacq. var. *angustifolia* Benth.

Vernacular names

ysterstoppe, sandolien, basterolienhout, ysterhouttoppe (A), mutepipuma (Sh), mutata-vhana (V).Description

Macroscopical¹



Figure 1 – Live plant

Small evergreen tree or large shrub to 5m, dioecious (more rarely bisexual); **leaves** simple, alternate, sessile, entire, narrowly elliptic to lanceolate, viscid, shiny-resinous, light green-yellow, up to 100 ´30mm, with tapering apex and base, texture soft to

papyraceous; **flowers** yellowish-green, apetalous, borne in dense racemes, panicles or corymbs; **fruit** a light brown to maroon-flushed, dry 3-winged capsule, about 1.5 cm in diameter and length.



Figure 2 – line drawing

Microscopical

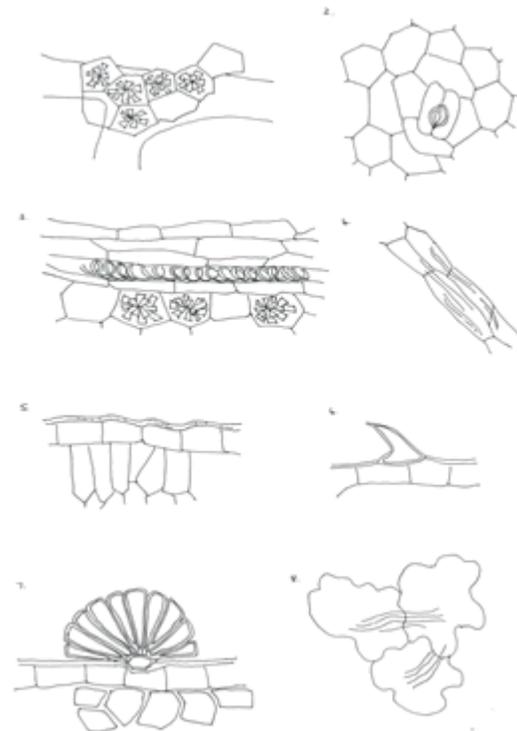


Figure 3 – microscopical features

¹Leenhouts, P.W. (1983) Notes on the extra-Australian species of *Dodonaea* (Sapindaceae). *Blumea* 28,2: 271-289.

Characteristic features are: the cells of the lower epidermis with sinuous walls and striated cuticle (8); the polygonal straight-walled cells of the upper epidermis (2); the numerous glandular hairs having unicellular stalks and 12-16 celled heads \pm 120m in diameter, with red-brown resinous contents (7); the unicellular clothing hairs, particularly abundant along leaf margin and main veins, \pm 20m in length with acute apex (6); the rosette aggregates of calcium oxalate \pm 20m in diameter in cells of the mesophyll, forming a crystal sheath accompanying main veins (1+3); the paracytic stomata, scattered on the upper but numerous on the lower leaf surface; the single palisade layer below the upper leaf epidermis (5).

Crude drug

Collected as required and used fresh, or air-dried and tied in bundles. The young leaves are yellow-green, viscid, faintly aromatic and soft to leathery in texture.

Geographical distribution

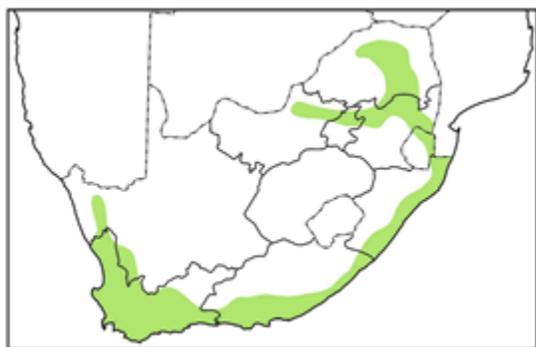


Figure 4 – distribution map

Widespread in southern Africa in a variety of habitats (forest margin, riverine thicket, rocky koppies) from Namaqualand to the Cape Peninsula and eastwards to Port Elizabeth, along the coastal belt north into Zimbabwe and Mozambique; nearly pantropical in distribution (Australia, Malesia, South America).

Quality standards

Identity test

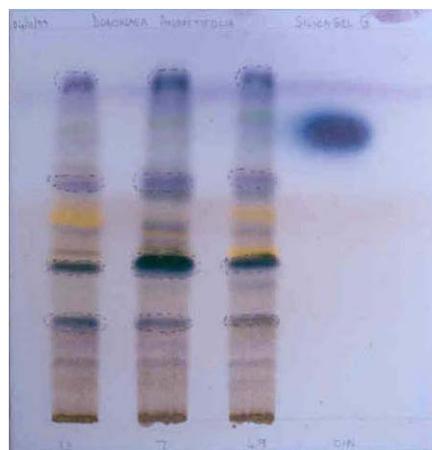
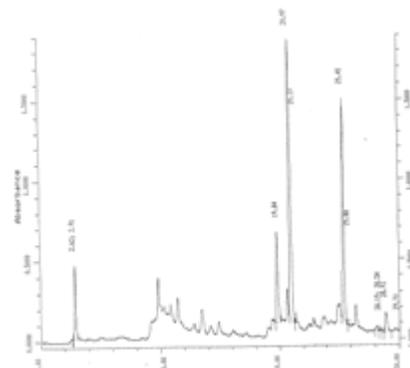


Figure 5 – TLC plate

Thin layer chromatography on silica gel using as solvent a mixture of toluene:diethyl ether:1.75m acetic acid (1:1:1).

Reference compound cineole (0,1% in chloroform). Method according to Appendix 2a.

R_f values of major compounds: 0,25 (grey-blue); 0,39 (navy blue); 0,61 (pink-mauve); 0,87 (purple); cineole: 0,73 (blue-purple)



HPLC on C₁₈ column, method according to Appendix 2b.

Major compounds:

Methanol extract: (figure 6a)

Retention times (mins): 2.91, 19.84, 20.97, 25.51

DCM Extract: (figure 6b)

Retention times (mins): 2.84, 5.67

Ethanol (70%) extractive value: not less than 38.00% (range 38.57-43.03%).

Purity tests

Assay

Not yet available

Major chemical constituents²

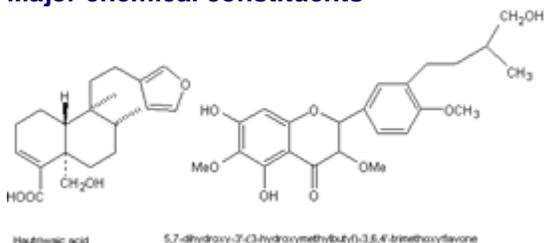


Figure 7 – chemical constituents

1. Diterpenoid acids: hautriwaic acid, dodonic acid and related compounds³.
2. Flavones e.g. santin (5,7-dihydroxy-3, 6, 4' trimethoxyflavone), penduletin and aliarin and a new flavonoid with an isoprenoid side-chain: 5,7-dihydroxy-3'-(3-hydroxymethylbutyl)-3,6,4'-trimethoxyflavone.
3. Flavanones e.g. pinocembrin.
4. Quinones, tannins, saponins and triterpene steroids were detected in preliminary tests in our laboratories. Cyanogenic glycosides and alkaloids were not detected.

² Sachdev, K. and Kulshreshtha, D.K. (1984). Dodonic acid, a new diterpenoid from *Dodonaea viscosa*. *Planta Medica* 50: 448-449.

³ Ibid. (1983). Flavonoids from *Dodonaea viscosa*. *Phytochemistry* 22: 1253-1256.

Dosage forms

An aqueous decoction or infusion of the fresh leaves and smaller twigs is taken orally, used as a gargle or applied topically.

Medicinal uses

Internal

A leaf infusion is used as a mild purgative and in the treatment of inflammation, chest colds, hypertension and arthritis.

External

A leaf infusion or decoction is used as a gargle for sore throat or fevers and applied locally to treat haemorrhoids or oral thrush.

Pharmacology/bioactivity

An aqueous extract, prepared by decoction from dried leaf material, showed activity in the brine shrimp lethality assay (concentration 1000mg dry extract/ml).

No antimicrobial activity against *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Candida albicans* or *Mycobacterium smegmatis* was shown by any of the extracts used in preliminary *in vitro* assays in our laboratories.

An 80% ethanolic extract of dried leaf of Ethiopian provenance showed no *in vitro* antimicrobial activity against *Mycobacterium tuberculosis* (conc. 2.0mg/ml)⁴

In vivo analgesic activity was demonstrated in the mouse (acetic acid-induced writhing test and hot plate method) and antipyretic activity in the rat (LP-induced rectal temperature increase).⁵ In all cases an

⁴ Asres, K., Bucar, F., Edelsbrunner, S., Kartnig, T., Hoger, G. and Thiel, W. (2001). Investigation of antimicrobial activity of some Ethiopian medicinal plants. *Phytotherapy Research* 15(4): 323-326.

⁵ Amabeoku, G.J, Eagles, P., Scott, G., Springfield, E. P. and Mayeng, I. (2001). Analgesic and antipyretic effects of *Dodonaea angustifolia* and *Salvia africana-lutea*. *Journal of Ethnopharmacology* 75(2/3): 117-124.

aqueous extract was administered IP at a concentration of 100.0mg/kg.

Contraindications

None known.

Adverse reactions

None known.

Precautions

No special precautions.

Dosage

An infusion may be made with two tablespoonsful ($\pm 7.0g$) of dried ground herb to which is added one litre of boiling water. The mixture is strained when cold. If fresh herb is used, four tablespoonsful of chopped leaf are infused with one litre of boiling water.

Adults: Half a teacupful (90ml) three times daily.

Children (6-12 years): Quarter of a teacupful three times daily.

