

# MELIANTHUS COMOSUS FOLIA

## Definition

Melianthus Comosus Folia consists of the fresh or dried leaves of *Melianthus comosus* Vahl. (Melianthaceae).

## Synonyms

## Vernacular names

kruidjie-roer-my-niet (A), ibonya (Z), ubuhlungubemamba (X)

## Description

### Macroscopical<sup>1</sup>



Figure 1 – Live plant

Branched woody shrub reaching a height of 2.5 m, entire plant giving off a foul odour when bruised; **leaves** green on upper surface, yellow on lower surface, borne in tufts at ends of branches, 6-16 cm long, divided in the upper  $\frac{3}{4}$  into 2-5 pairs of opposite leaflets, each 3-5 cm long  $\times$  0.5-2cm wide, with coarsely toothed margin and prominent midrib beneath, thinly hairy on upper surface, densely hairy on lower surface; **flowers** (Aug-Oct) dark red,

<sup>1</sup> Phillips, E.P. and Hofmeyr, J. (1927). The genus *Melianthus*. *Bothalia* 2: 351-355.

solitary, borne at nodes on the peduncle; **fruit** a 4-winged papery capsule 3-5 cm long containing many black shiny seeds, each 3-4 mm in diameter.



Figure 2 – line drawing

### Microscopical

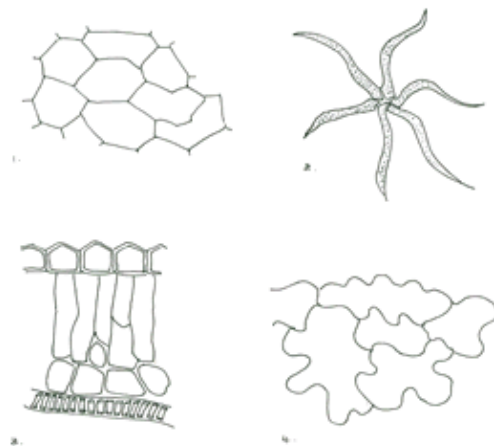


Figure 3 – microscopical features

Characteristic features are: the epidermal cells of the leaf lamina, those of the upper surface small with polygonal walls and of the lower surface larger, with sinuous walls; the stomata present on the lower leaf surface only; the single palisade layer beneath the upper epidermis; the absence of calcium oxalate crystals; the stellate hairs of both leaf surfaces, most abundant on the lower

surface, with 4-7 arms, each up to 160 microns in length.

1. Cells of the upper leaf epidermis
2. Stellate hair from leaf surface
3. T/S leaf lamina showing epidermal cells of upper surface and single palisade layer
4. Cells of lower leaf epidermis

### Crude drug

Collected as required or found in the marketplace, usually as fresh leaf; colour dull yellow-green, texture rough and leathery, odour characteristic unpleasant.

### Geographical distribution



Figure 4 – distribution map

Occurs in drier areas of the Western, Northern and Eastern Cape Provinces, Free State Province and Lesotho.

### Quality standards

#### Identity tests



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<sub>f</sub> values of major compounds: 0,47 (sage green); 0,53 (mauve brown); 0,61 (purple); 0,67 (light green); cineole: 0,88 (blue-purple)

HPLC on C<sub>18</sub> column, method according to Appendix 2b.

#### Major compounds:

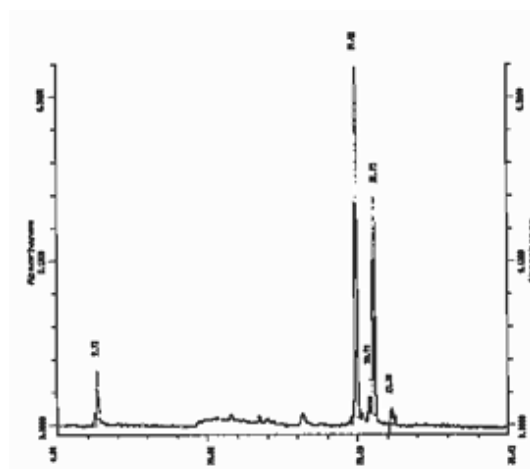


Figure 6 – HPLC spectrum

Methanol extract: (Figure 6)  
Retention times (mins): 19,95; 21,15

**Ethanol (70%) soluble extractive value:**  
not less than 35,0% (range: 35.33-35.39%)

#### Purity tests

#### Assay

Not yet available

#### Major chemical constituents

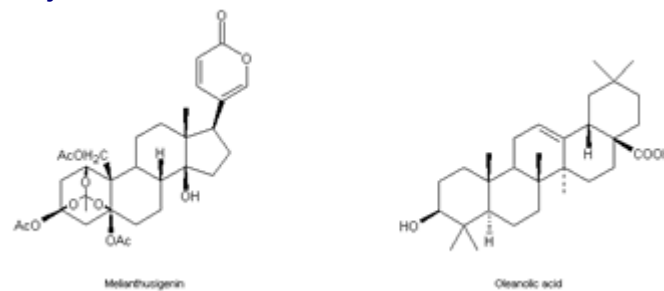


Figure 7 – chemical constituents

Microchemical tests in our laboratories indicated the presence of tannins and saponins but not of alkaloids nor of cardiac, cyanogenic or anthraquinone glycosides. A phytochemical analysis of the root bark of *Melianthus comosus* identified the triterpene oleanolic acid<sup>2</sup> and a derivative and alkaloids have been recorded from cultivated plants grown in California<sup>3</sup>. Bufadienolides e.g melianthusigenin have been recorded from this species<sup>4</sup> (figure 7)

### Dosage forms

Preparations of this species are rarely used for other than external application, oral toxicity being almost universally acknowledged among traditional practitioners. A leaf infusion or paste is applied to the affected area as a lotion or dressing; leaves may be placed in the bath as a hot soak.

### Medicinal uses

Warm aqueous leaf infusions may be applied as a lotion to sores, ulcers, bruises, swellings or wounds that are slow to heal, including venereal sores; a leaf paste may be applied as a local dressing to the affected area. An ointment of the bark, leaf and flower of *Melianthus comosus* is used in combination with *Melianthus major*, *Lobostemon fruticosus* and *Galenia africana* to treat wounds and a decoction of the same species as an antiseptic wash for skin diseases. A watery lotion of similar composition is used to treat syphilis and as a gargle for sore throat. A bath medicated with the herb is said to induce sweating and to relieve joint pains. The root is also used

both prophylactically and therapeutically by the Xhosa people in the treatment of snakebite; for this purpose the root is chewed and a root bark tincture applied locally to the wound. A leaf paste or decoction is also utilised for snakebite.

### Pharmacology/bioactivity

*In vitro* antimicrobial activity of aqueous leaf extracts of *Melianthus comosus* was observed against *Candida albicans*, *Staphylococcus aureus* and *Mycobacterium smegmatis*, in the concentrations used for disc assays in our laboratories. No activity was demonstrated against *Pseudomonas aeruginosa*.

*In vivo* antitumour activity of various concentrations of whole plant extracts (95% ethanol) of this species against leukP-388, colon-38 and melanoma B-16 cells was investigated in the mouse (IP); no activity was recorded<sup>5</sup>. In the same study, the cytotoxicity (ED<sub>50</sub> 5.9 mcg/ml) of a 95% ethanol extract was investigated in cell culture (CA-9KB cells). General toxic effects of the same extract were investigated in the mouse (IP) against colon carcinoma 38 and leukaemia-P388 cells (active in both assays at a dose of 400mg/kg).

### Contraindications

None recorded provided that traditional methods of preparation and usage are followed. The use of preparations of this herb is nevertheless not recommended for children under six years.

### Adverse reactions

None reported in association with external use. Should irritation of the skin or mucous membrane occur, treatment should be discontinued.

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<sup>2</sup> Koekemoer, J.M., Vermeulen, N.M.J. and Anderson, L.A.P. (1974). Chemistry of *Melianthus comosus*: VI. Structure of a new triterpenoid acid from the root bark. *Journal of the South African Chemical Institute* **27**: 131-136.

<sup>3</sup> Hultin, E. (1965). Alkaloid screening of plants from Boyce Thompson Southwestern Arboretum. *Acta Chemica Scandinica* Ser. A. **19(6)**: 1297-1300.

<sup>4</sup> Anderson, L.A. P. and Koekemoer, J.M. (1969). Toxic bufadienolides from *Melianthus comosus*. *Journal of the South African Chemical Institute* **22**: S119-124.

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<sup>5</sup> Suffness, M., Abbott, B., Statz, D.W., Wonilowicz, E. and Spjut, R. (1988). The utility of P388 leukaemia compared to B16 melanoma and colon carcinoma 38 for *in vivo* screening of plant extracts *Phytotherapy Research* **2(2)**: 89-97.

## Precautions

The internal use of preparations of *Melianthus comosus* is not recommended. Animal studies <sup>GR 1</sup> indicate oral toxicity, a 5% decoction producing vomiting and gastro-intestinal irritation. Subcutaneous injection of an aqueous root infusion resulted in lassitude, vomiting, loss of appetite and death. A sheep drench made from 80g of dried flower, young fruit and leaf resulted in death 4½ after administration; dyspnoea, cyanosis and feeble accelerated pulse occurred 3 hours after administration and *post mortem* findings included haemorrhage and inflammation of the duodenum, jejunum and other internal organs.

## Dosage

Dried (5-10g) or fresh (10g-20g) leaf is mixed with one litre of boiling water in a closed vessel and allowed to stand until the resultant infusion can be applied to the skin or oral mucosa without discomfort. Strain before use. If a dressing is required, a paste may be prepared from fresh leaf softened in a little vegetable oil with the aid of gentle heat. Apply to the affected area on clean lint or gauze.

