

# ERIOCEPHALUS HERBA

## Definition

Eriocephalus Herba consists of the fresh or dried flowering tops of *Eriocephalus africanus* L. subspecies *africanus* and of subspecies *paniculatus* (Asteraceae).

## Synonyms

*Eriocephalus umbellulatus* DC.

## Vernacular names

wilderoosmaryn, kapokbossie (A), wild rosemary

## Description

### Macroscopical



Figure 1 – Live plant

This species is highly variable as regards habit, leaf form and composition of the capitulum, but two groupings are recognised at subspecific level. Subspecies *africanus* comprises spreading succulent-leaved forms from the coastal shrublands, while subspecies *paniculatus* is of more erect habit, not succulent and with a mainly inland distribution.

Much-branched woody shrub to 0,9m in height and 4m in diameter. Old branches grey-brown to black, younger twigs red-brown to grey-green, pilose to glabrous; **leaves** highly aromatic, ericoid, succulent or non-succulent, arranged in fascicles, blue to grey-green or silver-grey tomentose, 8-17 ' 0,4-2.5mm, segmented in ssp. *africanus*. **Inflorescence** a capitulum with white to pale

pink female disc florets and falsely bisexual purple ray florets, arranged in terminal umbels, up to 9 per umbel, borne on peduncles  $\pm$ 8-10 mm in length; pappus covered after anthesis with indumentum of white silky hairs; seeds 1-3mm long.



Figure 2 – line drawing

### Microscopical

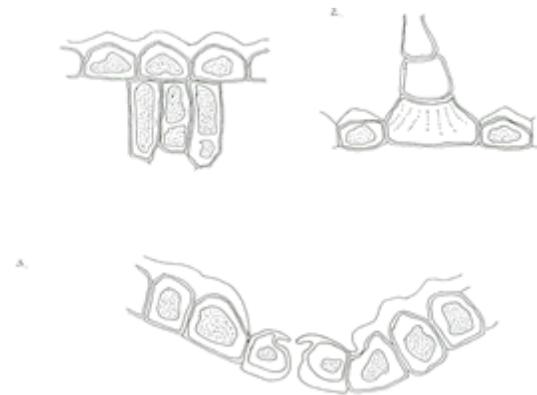


Figure 3 – microscopical features

Characteristic features are: the papillate cells of the epidermis, with thick cuticle and dark staining contents, each bearing a 2-3 celled thin-walled uniseriate clothing hair, up to 1mm long, with swollen basal cell; the

occasional pale yellow-brown spherical pollen grains,  $\pm 25\mu$  in diameter, with warty exine; the ericoid leaves, almost cylindrical in transverse section, with 2-3 vascular strands and palisade layer beneath the epidermis; the absence of calcium oxalate crystals.

1. T/S papillate cells of epidermis, showing thick cuticle and dark staining contents
2. T/S leaf epidermis showing 2-3 celled, thin-walled, uniseriate clothing hair, up to 1mm long, with swollen basal cell
3. Epidermal cells showing stomata

### Crude drug

Collected fresh when needed or available on markets as bundles of dried to semi-dried material. Most parts of the crude drug, which may comprise leaf, flower, fruit and seed, are highly aromatic.

### Geographical distribution

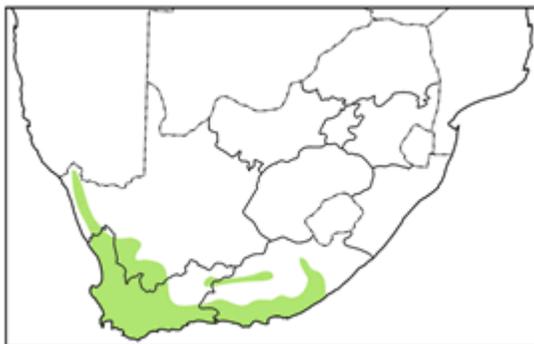


Figure 4 – distribution map

Widespread in the Western and Eastern Cape Province and Namaqualand. Subspecies *africana* occurs near the coast on saline or sandy soils of the Cape Peninsula and between Mossel Bay and Knysna; subspecies *paniculatus* is found further inland.

### Quality standards

#### Identity test

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: 0,46 (yellow); 0,57 (blue-grey); cineole: 0,89 (blue-purple)



Figure 5 – TLC plate

HPLC on  $C_{18}$  column, method according to Appendix 2b.

#### Major compounds:

Methanol extract: (figure 6a)

Retention times (mins): 11.08; 19.20; 20.90; 21.84; 24.24; 25.30

DCM Extract: (figure 6b)

Retention times (mins): 2.10; 2.54; 2.62; 3.55; 4.68

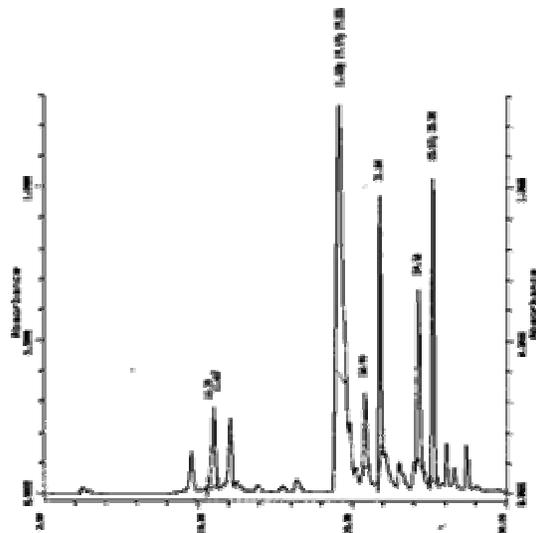


Figure 6 a – MeOH HPLC spectrum

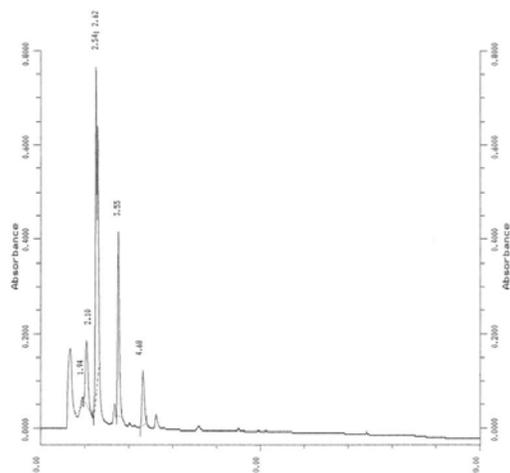


Figure 6 b – DCM HPLC spectrum

**Ethanol (70%) soluble extractive value:** not less than 24% (23.93-31.07%).

**Volatile oil content:** not less than 0,67% (0,67-1,33%).

#### Purity tests

#### Assay

#### Major chemical constituents

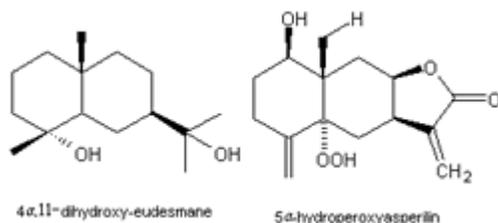


Figure 7 – chemical constituents

Aerial parts of the plant have been shown<sup>1</sup> to contain a mixture of sesquiterpene lactones of the eudesmanolide type e.g. 4a, 11-dihydroxy-eudesmane (4,11-eudesmanediol), 11-OH-5a-hydroperoxy-eudesmane, ivangustin and related compounds. The aliphatic alcohol dehydrofalcariinol has also been isolated.

<sup>1</sup> Zdero, C., Bohlmann, F. and Muller, M. (1987). Sesquiterpene lactones and other constituents from *Eriocephalus* species. *Phytochemistry* **26(10)**: 2763-2775.

Microchemical tests (our laboratories) indicated the presence of tannins, but not of alkaloids, saponins, cyanogenic glycosides or triterpene steroids.

#### Dosage forms

An aqueous decoction or infusion, or a brandy tincture is taken orally.

#### Medicinal uses

The use of this plant is recommended in traditional practice as a diuretic for the treatment of oedema, as a remedy for gynaecological and gastric disorders, as a diaphoretic and haemostatic.

#### Pharmacology/bioactivity

Antispasmodic activity has been associated with 4, 11-eudesmanediol<sup>4</sup> and may underlie the use of this species as a remedy for dysmenorrhoea or stomach ache. Tannin content may account for reputed haemostatic properties.

In an *in vitro* assay for antimicrobial activity of leaf, stem and root extract fractions (CHCl<sub>3</sub>, EtOH, MeOH, petrol ether, H<sub>2</sub>O), no activity was demonstrated by any of the leaf or stem extracts against *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Mycobacterium smegmatis* or *Candida albicans*<sup>2</sup>. Weak activity of a methanolic root extract (MIC 10.0mg/ml) against *Staphylococcus aureus* was demonstrated.

*In vitro* antimicrobial activity was demonstrated against *Staphylococcus aureus* (our laboratories) by aqueous extracts of dried leaf material, at concentrations of 10mg/ml and 5mg/ml. No *in vitro* activity was demonstrated against *Pseudomonas aeruginosa*, *Mycobacterium smegmatis* or *Candida albicans*.

#### Brine shrimp lethality assay:

Activity was shown by extracts prepared from dried leaf material by decoction (our

<sup>2</sup> Salie, F., Eagles, P.F. and Leng, H.M. (1996). Preliminary antimicrobial screening of four South African Asteraceae species. *Journal of Ethnopharmacology* **52(1)**: 27-33.

laboratories), at a concentration of 1 000mg/ml.

### **Contraindications**

None known.

### **Adverse reactions**

None known.

### **Precautions**

No special precautions

### **Dosage**

One-third of a teacupful (60ml) of an infusion (one tablespoonful of dried herb/1 litre of boiling water) three times daily.



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