

# GUNNERA PERPENZA RHIZOMA

## Definition

*Gunnera Perpensa Rhizoma* consists of the fresh or dried rhizome of *Gunnera perpensa* L. (Gunneraceae).

## Synonyms

### Vernacular names

Wilde ramenas, wilde kalbas, rivierpampoer (A), river pumpkin, qobo (S), ipuzi lomlambo (Xh), ughobo, uklenya (Z).

## Description

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

Rhizomatous thinly hairy perennial herb to 1m in height; **leaves** palmate, tufted, near apex of rhizome, round to reniform with dentate margin, 4-25 × 6-38 cm, on stout petioles 15-75cm long; **flowers** (Oct-Jan) male, female or bisexual, greenish, sessile, borne in spike-like racemes 2-10cm long; **rhizome** creeping, to 3cm thick, yellow-fleshy internally.



Figure 1a: fresh rhizome



Figure 1b: Live plant



Figure 2: line drawing

### Microscopical

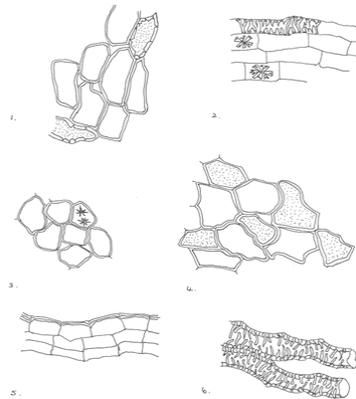


Figure 3: microscopical features

Characteristic features are: the light brown cork tissue of the outer bark (5); the thick-walled parenchyma and collenchyma with intercellular spaces (1), staining bright yellow-orange with phloroglucinol/HCl; the many reticulately thickened vessels up to 120 $\mu$  in diameter (6); the groups of grey-brown cells of the cortex (4); the absence of starch and tanniferous tissue; the calcium oxalate crystals of the central stele, up to 40 $\mu$  in diameter (2).

### Crude drug

Collected as required or obtained in the marketplace as fresh to semi-dry pieces of rhizome, up to 15cm long and 3cm in diameter, dark brown externally, cream to

<sup>1</sup> Mendes, E.J. (1978). Haloragaceae. *Flora Zambesiaca* 4: 74-81.

dark pink internally, texture hard to fleshy, odour faint.

### Geographical distribution

Marshes, stream banks and permanent seeps of the Western and Eastern Cape Provinces, Free State Province, KwaZulu/Natal, Mpumalanga, Swaziland, Lesotho; also Zimbabwe, Malawi and East Tropical Africa.

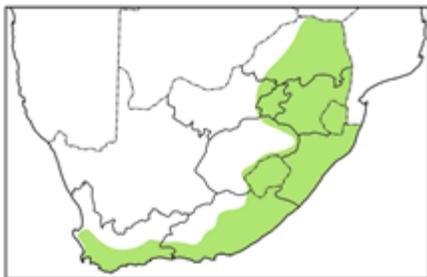


Figure 4: distribution map

### Quality standards

#### Identity tests

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: 0.04 (pale lilac); 0.12 (pale lilac); 0.30 (grey-mauve); 0.36 (grey-mauve); 0.42 (grey-brown); 0.59 (light purple); cineole: 0,79 (blue-purple)

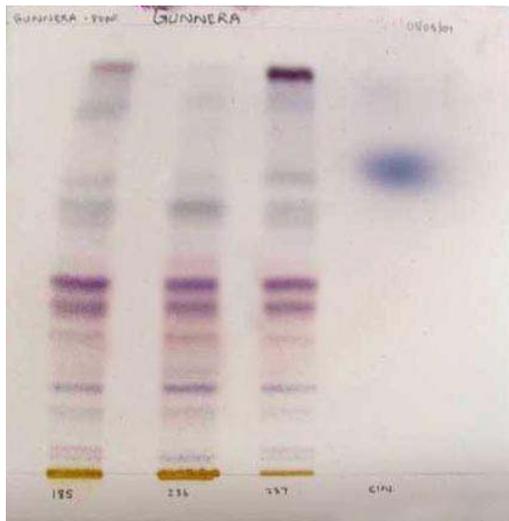


Figure 5: TLC plate

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

#### Major compounds:

Methanol extract:

Retention times (mins): 2.89; 4.35; 6.12; 11.31; 13.77; 21.08; 25.88

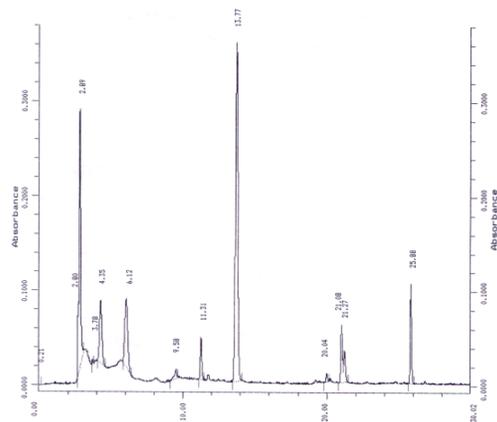


Figure 6: HPLC spectrum

Ethanol (70%) soluble extractive value: not less than 34.81% (range: 34.81-38.18%)

#### Purity tests

#### Assay

Not yet available

#### Major chemical constituents

Little is known of the chemistry of this species. The occurrence of a bitter principle, named celastrin, has been reported<sup>GR1</sup>

#### Dosage forms

Aqueous infusions and decoctions are taken orally but may also be applied externally as a lotion or wound dressing.

#### Medicinal uses

Root decoctions are used in traditional gynaecological practice as well as traditional veterinary practice to initiate labour, assist delivery or to expel the placenta. *Gunnera perpensa* rhizome is a common ingredient of *inembe* and *isihlambezo*, preparations used during the last trimester of pregnancy to ensure healthy foetal growth and easy

delivery<sup>2</sup>. Decoctions are also taken orally to relieve dysuria, rheumatic pains and dyspepsia, as a stomachic, or for colds. Externally a decoction is used as a wound dressing. Infusions may be taken internally or applied externally to treat psoriasis.<sup>GR1</sup>.

### Pharmacology/bioactivity

An aqueous decoction of *Gunnera perpensa* rhizome exhibited direct activity on isolated rat uterine smooth muscle but not on that of the ileum. Response to oxytocin-induced uterine contractions were potentiated by the extract<sup>3</sup>. Abortifacient activity has been reported, but details are not available<sup>4</sup>.

Water, hexane and 100% ethanol extracts of dried root, assessed for *in vitro* antibacterial activity against *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Bacillus subtilis* and *Escherichia coli*, were found to be inactive in the concentrations used<sup>5</sup>.

### Contraindications

To be established.

### Adverse reactions

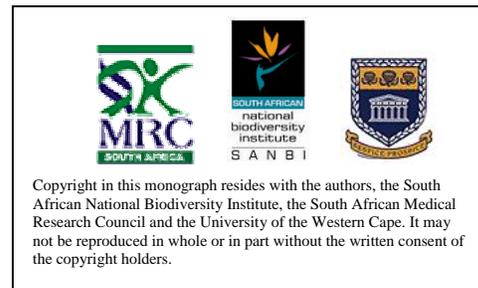
None reported but investigation necessary.

### Precautions

The use of this herb during pregnancy should be undertaken only on the advice of a competent traditional practitioner. Non-pregnant women taking *Gunnera perpensa* preparations for other indications should be advised of the possibility of abortifacient activity.

### Dosage

To be determined.



<sup>2</sup> Veale, D.J.H., Oliver, D.W., Arangies, N.S. and Furman, K.I. (1992). South African traditional herbal remedies used during pregnancy and childbirth. *Journal of Ethnopharmacology* **36**: 185-191.

<sup>3</sup> Kaido, T.L., Veale, D.J.H., Havlik, I. and Rama, D.B.K. (1997). Preliminary screening of plants used in South Africa as traditional herbal remedies during pregnancy and labour. *Journal of Ethnopharmacology* **55**: 185-191.

<sup>4</sup> Jonathan, L.T. (1995). Traditional versus modern medicine: the case for a collaborative approach to primary health care. *Journal of Research: Ethnomedicine in Africa*: 9-18. National University of Lesotho Occasional Publication **4**, Roma, Lesotho.

<sup>5</sup> Mc Gaw, L.J., Jager, A.K. and van Staden, J. (2000). Antibacterial, anthelmintic and anti-amoebic activity of South African medicinal plants. *Journal of Ethnopharmacology* **72(1/2)**: 247-263.