

## ALEPIDEA AMATYMBICA RHIZOMA

### Definition

Alepidea Amatymbica Rhizoma consists of the fresh or dried rhizome and root of *Alepidea amatymbica* Eckl. & Zeyh. (Apiaceae).

### Synonyms

### Vernacular names

Kalmoes (A); ikhathazo (Z); lesooko (S), iqwili (Xh)

### Description

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

Erect robust perennial herb to 2m in height with hollow grooved stems and a rhizomatous rootstock; **leaves** mostly basal on petioles up to 200mm long, with a few stalkless clasping stem leaves; glossy green on upper surface with prominent venation on lower surface; lamina lanceolate to cordate; 300 - 100 × 20 - 75mm, with dentate margin, each tooth terminating in a long bristle; **flowers** (Jan-Mar) white, borne in heads 10 - 20mm in diameter, arranged in panicles; each head with 5 unequal involucre bracts, the latter white to pale yellow above, olive green on lower surface.

Three varieties have been distinguished on the basis of leaf shape and involucre segment size:

var. *amatymbica*

var. *microbracteata* Weim.: differs from var. *amatymbica* in its shorter involucre segments (5mm long as opposed to 10mm in the typical variety)

var. *aquatica* (Kuntze) Weim.: differs from var. *amatymbica* in its longer, narrower leaves (up to 400mm long and 30-40mm wide)<sup>2</sup>



Figure 1a: Dried Root



Figure 1b: Live plant

### Microscopical

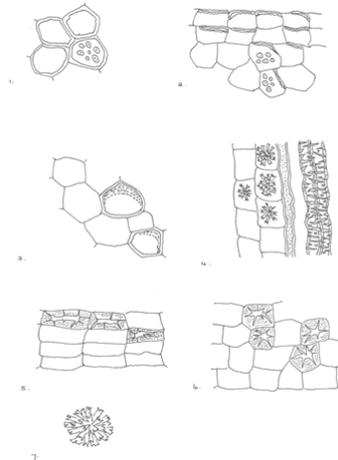


Figure 3: microscopical features

Characteristic features are: the abundant golden brown to red brown cork cells (2), the yellow oleoresin canals (3), 250-300µ in diameter, in two concentric rings accompanying the vascular tissue; the numerous sclereids, up to 220µ in diameter, with narrow lumen (5+6); small starch granules each 20-30µ in diameter in the cortical collenchyma (1) and parenchyma of the central stele; the reticulate and spirally thickened vessels, 70-120µ in diameter, with lignified walls; the calcium oxalate rosette aggregates, each up to 160µ in diameter (7), in cells of the parenchyma surrounding the

<sup>1</sup> Weimarck, (1949). *Botaniska Notiser* 4: 219-262.

<sup>2</sup> De Castro, A. and van Wyk, B-E. (1994). Diagnostic characters and geographic distribution of *Alepidea* species used in traditional medicine. *South African Journal of Botany* 60(6): 345-350.

vascular tissue and oleoresin ducts, forming an incomplete crystal sheath (4).

### Crude drug

The fresh rhizome is russet-brown externally with adhering roots; the cut surface shows two rings of oleoresin ducts in a matrix of pale yellow ground tissue; odour pleasant aromatic, texture crisp resinous when fresh; fracture sharp when dry.

### Geographical distribution

Locally common in grassland of the northern and southern Drakensberg mountains of the Eastern Cape Province, Lesotho, Kwazulu-Natal, Swaziland, Mpumalanga and Northern Province; also northwards into Zimbabwe, on streambanks, drainage lines and forest margins between 850-2500m. Var. *amatymbica* is widespread but var. *aquatica* is recorded only from the Eastern Cape Province between Somerset East and Cala, and var. *microbracteata* only from the Umzinto region of southern Kwazulu/Natal<sup>1</sup>. Recent work suggests however that only two forms of *Alepidea amatymbica* are distinguishable: a typical form from the Eastern Cape with leaves tapering toward the base and a northern form with cordate leaves<sup>2</sup>.

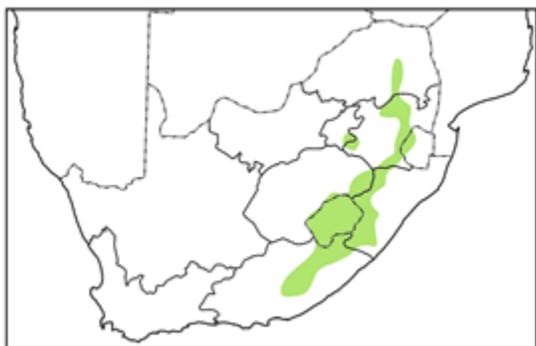


Figure 4: distribution map

### 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.

Only one collection of this species was available for TLC assessment. Further work is required.

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

### Major compounds:

Methanol extract:

Retention times (mins): 5.67; 6.93

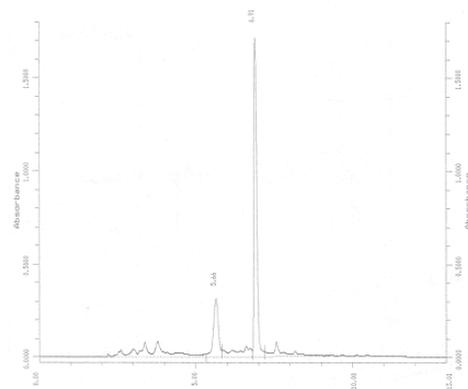


Figure 6: HPLC spectrum

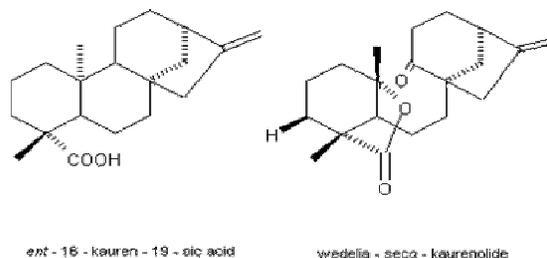
### Purity tests

#### Assay

Not yet available

### Major chemical constituents

This species has been shown to contain a mixture of several kaurene-type diterpenes such as *ent*-16-kaurene-19-oic acid (see a below)<sup>3</sup>, which may together constitute up to 11.8% of rhizome and root dry mass<sup>4</sup>. Very similar compounds occur in *Arctopus echinatus* (Apiaceae), also used in traditional medical practice.



<sup>3</sup> Rustaiyan, A. and Sadjadji, A.S. (1987). Kaurene derivatives from *Alepidea amatymbica* (sic). *Phytochemistry* **26**(7): 2106-2107.

<sup>4</sup> Holzapfel, C.W., van Wyk, B-E., de Castro, A., Marais, W. and Herbst, M. (1995). A chemotaxonomic survey of kaurene derivatives in the genus *Alepidea* (Apiaceae). *Biochemical Systematics and Ecology* **23**(7/8): 799-803.

## Figure 7: chemical constituents

### Dosage forms

Fresh or cooked rhizome and roots are chewed or sucked and dried powdered drug used as a snuff. Smoke from burning dry material is inhaled and a root infusion taken orally or administered *per rectum* as an enema. Fresh rhizome is applied externally as a styptic. <sup>GR1, 12, 28</sup>

### Medicinal uses

This species is highly regarded as a remedy for respiratory tract infections, asthma, sore throat, gastro-intestinal complaints, fever, rheumatism, bleeding wounds and headache.

### Pharmacology/bioactivity

Preliminary *in vivo* assays (animals) have demonstrated antimicrobial, antihypertensive and diuretic activity <sup>GR12</sup>. *In vitro* vasorelaxation (rat aorta; dose 0,1mg/ml) and *in vivo* diuretic activity (IG; rat; dose 50.0mg/kg) have been demonstrated for hexane/ethyl acetate extracts of fresh rhizome<sup>5</sup>

The results of an investigation of cytotoxicity and antiviral activity of 16 South African plant species<sup>6</sup> showed that aqueous extracts of *Alepidea amatymbica* were not cytotoxic, at any concentration used in the test, to HeLa, Vero, Jurkat E6.1, AA-2 or CEM-SS cells. Similar extracts were found to reduce the infectivity of both Cocksackie B2 virus and HSV-1, at most dilutions used. In a cell culture antiviral assay, aqueous extracts did not inhibit replication of HSV-1 but inhibited that of Cocksackie B2 virus at the higher concentrations tested.

<sup>5</sup> Somova, L.I., Shode, F.O., Moodley, K. and Govender, Y. (2001). Cardiovascular and diuretic activity of kaurene derivatives of *Xylopiya aethiopyca* and *Alepidea amatymbica*. *Journal of Ethnopharmacology* **77(2/3)**: 165-174.

<sup>6</sup> Treurnicht, F. T. (1997). An evaluation of the toxic and potential antiviral effects of some plants used by South Africans for medicinal purposes. MSc thesis, University of Stellenbosch.

### Contraindications

None known

### Adverse reactions

None recorded

### Precautions

No special precautions

### Dosage

For respiratory complaints (cough, cold, influenza), the recommended adult dose is one tablespoonful of raw or cooked rhizome and root; for children one to two teaspoonsful, according to age, is sufficient <sup>GR12</sup>.

