BULBINE FRUTESCENS FOLIA

Definition

Bulbine Frutescens Folia consists of the fresh leaves of *Bulbine frutescens* (L.) Willd. (Asphodelaceae)

Synonyms

*Bulbine caulescens* L  
*Bulbine rostrata* Willd.

Vernacular names

Rankkopieva (A), ibhucu, ithethe elimpofu (Z)

Description

Macroscopical

Spreading geophytic shrublet with rhizomatous rootstock and numerous wiry roots; leaves bright green, glabrous, succulent, subterete, to 150mm long and 4-8mm thick; flowers (Aug-Apr) in dense elongated racemes up to 30cm long, yellow, orange or white, with bearded stamens

Microscopical

Characteristic features are: the leaf in T/S shows an epidermis of colourless, thick-walled, non-suberised cells, a band of photosynthetic and vascular tissue around the leaf perimeter (2+3), a central core of large thin-walled cells with contents staining pink-orange with KOH solution; yellow-green stomata and idioblasts containing bundles of calcium oxalate raphides (1), each up to 200µ long, in cells of the outer leaf perimeter; the absence of tannins.

Crude drug

Gathered as needed and used fresh; seldom seen in the marketplace

Geographical distribution

Sandy flats and slopes of Namaqualand and the Karoo, in dry areas throughout southern Africa: Northern, Western, Eastern Cape
and Free State Provinces, Lesotho, KwaZulu-Natal.

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. (figure 5) Rf values of major compounds: 0.5 (orange); 0.55 (light purple); 0.67 (purple); 0.8 (pale green); 0.83 (light purple); cineole: 0.76 (blue-purple).

Figure 5: TLC plate

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

Major compounds:
Methanol extract: (figure 6)

Figure 6: HPLC spectrum

Retention times (mins): 3.05; 5.95; 17.49; 17.84

Total ash: 9.32% (determined according to the BHP 1996 using 1.0g dried ground material; a pale grey-yellow residue remains after ignition in muffle furnace).

Loss on drying: loses not less than 94% (range: 94.3-95.66%) of its weight on drying in an oven at 105°C for three days.

Purity tests

Assay

Not yet available

Major chemical constituents

The biaryl anthraquinones knipholone and isoknipholone, based on a chrysophanol skeleton (see figure 7), have been isolated from the roots of *Bulbine frutescens* as well as from other *Bulbine* species\(^1\). These differ from the anthraquinones of the related genus *Aloe* (subfamily Alooideae) in that the latter are mainly aloe-emodin derivatives.

Knipholone, together with two new phenylanthraquinones (Gaboroquinones A and B) and a demethylknipholone glucoside, 1

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have been isolated from the roots of plants growing in Botswana³.

![Chemical Constituents](image)

**Figure 7: chemical constituents**

**Dosage forms**

Fresh leaf juice is usually applied directly to the skin.

**Medicinal uses** GR1, 12, 20

Some 41 *Bulbine* species occur in South Africa and 6-7 are used medicinally; the leaf gel of most of these is used, the species possibly interchangeably, as an external application for the treatment of sores, wounds, skin rashes, cracked lips, eczema and ringworm; less often also to relieve sciatica. Whereas the underground parts of the other 6-7 species are used to prepare enemata or infusions for oral administration to treat diarrhoea, colic, urinary tract infections and venereal diseases, only the leaf juice of *B. frutescens* appears to have found a place in traditional medical practice.

**Pharmacology/bioactivity**

Aqueous and methanolic extracts of dried leaf, investigated for *in vitro* antimicrobial activity against *Staphylococcus aureus*, *S. epidermidis* and *Bacillus subtilis*, were found to be inactive (conc. 1mg/ml)⁴. Knipholone has been tested for *in vitro* antimicrobial activity against *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Bacillus subtilis*, *Micrococcus luteus* and *Candida albicans* ¹, but was found to be inactive. No other information is available regarding the bioactivity of *B. frutescens*.

**Contraindications**

None known

**Adverse reactions**

Brown staining of the skin after using the leaf gel is reported GR1

**Precautions**

No special precautions

**Dosage**

To be applied frequently to the affected parts for 7 days. If symptoms persist, alternative therapy should be sought.

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