CARPOBROTUS ACINACIFORMIS FOLIA

Definition

Carpobrotus Acinaciformis Folia consists of the fresh or dried leaves of *Carpobrotus acinaciformis* L. (L. Bol.) (Aizoaceae).

Synonyms

Carpobrotus concavus L. Bolus
Carpobrotus vanzijliae L. Bolus

Vernacular names

Elandvye, strand-vy, suurvy (A), t'gaukum, gouna, sour fig

Description

Macroscopical [GR3]

Mat-like succulent perennial with trailing stems up to 1.8m long; **leaves** opposite, in pairs, partly united at the base, triangular in cross section, up to 90mm long and 15-20mm thick, curved, sabre-shaped; **flowers** (Aug-Oct) brilliant magenta-pink, borne singly at the end of a short stalk, 120mm in diameter; **fruits** fleshy, constricted at the base, becoming leathery on drying; receptacle globose to oblong.

Figure1: colour plate of live plant

Figure 2: line drawing

Microscopical

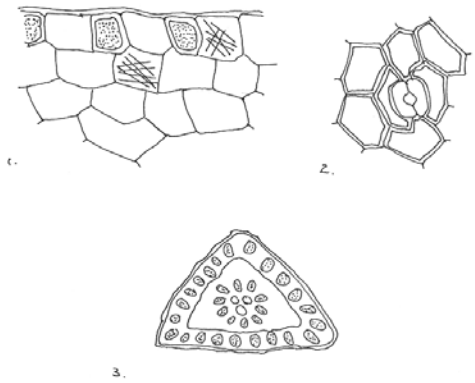


Figure 3: microscopical features

Characteristic features are: the epidermal cells of the leaf with thickened cuticularised walls and paracytic stomata (1+2); the calcium oxalate raphide bundles occurring in cells of the leaf epidermis and subepidermal layer (1); the red-brown tannin idioblasts of the epidermal layer (1) and central stele, arranged in two concentric rings (3).

Crude drug

Succulent dull green when fresh, drying to brittle pale green; taste sour and astringent.

Geographical distribution

Coastal loose sands and rocky outcrops of the Western Cape Province, from Saldanha Bay to the Cape Peninsula and eastwards to Mossel Bay. May cover large areas.

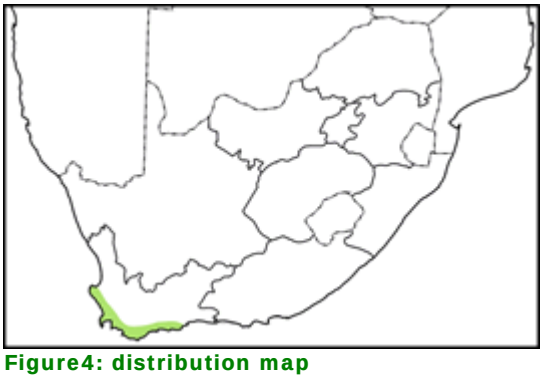


Figure4: distribution map

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_f values of major compounds: cineole: (blue-purple)

Note The method used for TLC and HPLC fingerprinting gave poor results for this species, possibly owing to the large amounts of tannin present. Tannin removal prior to TLC [1], [2] has been shown to improve band separation.

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

Major compounds:

Total ash: 25.9% (determined according to the BHP 1996 using 1.0g dried ground material)

Purity tests

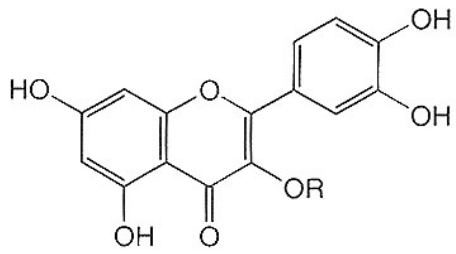
Assay

Not yet available

Major chemical constituents

Little is known of the secondary chemistry of this species. Citric and malic acids and their calcium salts have been recorded as present, as has the alkaloid mesembrine, which occurs in several genera of Aizoaceae. [GR1]

Other South African *Carpobrotus* species have been shown to contain hydrolysable tannins, various flavonoids e.g, rutin and hyperoside, phytosterols and aromatic acids [1, 2].



Hyperoside; R = galactosyl
Rutin; R = rhamno-glucosyl

Figure 5: chemical constituents

Dosage forms

Fresh leaf juice is used externally as a mouthwash, gargle, lotion and antiseptic wash. Preparations of the fruit are taken internally, applied to the skin or used as a mouthwash/gargle.

Medicinal uses

Preparations of the fruit are taken orally for the treatment of tuberculosis and other pulmonary infections. Leaf juice is applied to sores or burn/scald wounds and used as a styptic. Preparations of leaf juice, taken orally, are said to be diuretic and to relieve dysentery. Preparations of both leaf and fruit are taken internally to treat heart conditions and used as a mouthwash or gargle for sore throat and sores in the mouth. [GR1]

There is some evidence that *C. acinaciforme* is used interchangeably with other *Carpobrotus* species. [2]

Pharmacology/bioactivity

Fresh leaf juice (freeze dried and reconstituted) showed antimicrobial activity against *Staphylococcus aureus,* in the concentrations used for disc assays in our laboratories. No activity was noted against *Candida albicans Pseudomonas aeruginosa* or *Mycobacterium smegmatis.*

---

[1] Van der Watt, E. and Pretorius, J.C. (2000). Purification and identification of active antibacterial components in *Carpobrotus edulis* (L.) L. Bol. *Journal of Ethnopharmacology* **76**: 87-91.

[2] Springfield, E.P., Amabeoku, G., Weitz, F., Mabusela W. and Johnson, Q. (2003). An assessment of two *Carpobrotus* species extracts as potential antimicrobial agents. *Phytomedicine* **10**: 434-439.

Ethanol (70%) extracts of fresh leaf of Greek provenance, tested for *in vitro* antibacteriophage activity against bacteriophages MS2, PHI-X0174, T-7, T2, T4 and Type1, were found to be inactive in all cases[3].

There is no other information in the published literature concerning the bioactivity of this species.

Other South African *Carpobrotus* species (*C. muirii* and *C. quadrifidus*) have however been shown to exhibit antimicrobial activity against *Staphylococcus aureus* and *Mycobacterium smegmatis* [2].
See also *C.edulis*

Contraindications

None known.

Adverse reactions

None recorded.

Precautions

No special precautions.

Dosage

To be determined.

[3] Verykokidou, E., Skaltsa, H., Couladis, M. and Delitheos, A. (1995). Antibacteriophage activity of some Greek plant extracts. *International Journal of Pharmacognosy* **33(4)**: 339-343.