PELARGONIUM CUCULLATUM HERBA

Definition

Pelargonium Cucullatum Herba consists of the fresh or dried leaves of *Pelargonium cucullatum* (L.) l'Hérit. (Geraniaceae).

Synonyms

Three subspecies of *Pelargonium cucullatum* are currently recognised:
subspecies *cucullatum*
Syn: *P. angulosum* (Mill.) l'Herit.; *P. cucullatum* (L.). l'Herit.
subspecies *tabulare*
Syn: P. cucullatum (L.) l'Herit.
subspecies *strigifolium*
Syn: *P. acerifolium* (Mill.) l'Herit.
Vernacular names
wildemalva

Description

Macroscopical[12]

Figure 1 – Live plant

Robust shrub reaching a height of 2 metres; **leaves** hooded, reniform, scented, softly hairy (subspp. *tabulare* and *cucullatum*) to harsh (subsp. *strigifolium*), margin reddish, irregularly dentate (subsp. *tabulare*) or angularly incised (subspp. *strigifolium* and *cucullatum*, 40-60mm long × 50-70mm wide; **flowers** (mainly in Spring) borne in umbellate inflorescences of 4-10 showy blooms, pink with darker markings to deep magenta, occasionally white; stamens 7 with orange pollen.

Figure 2 – line drawing

Microscopical (subsp. *tabulare*)

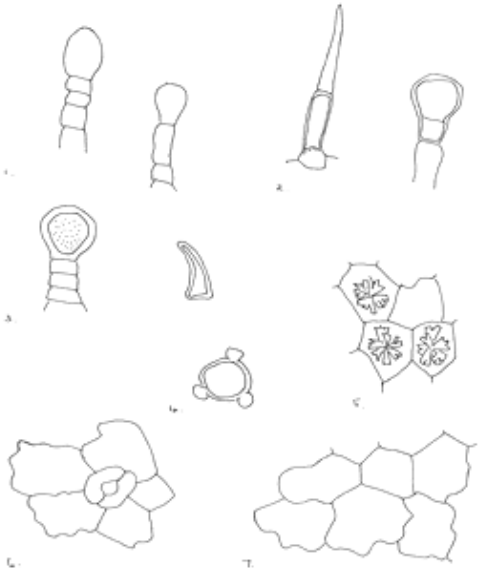


Figure 3 – microscopical features

[1] Van der Walt, J.J.A. (1977). Pelargoniums of Southern Africa. Purnell, Cape Town.

[2] Van der Walt, J.J.A. and Vorster, P.J. (1988). Pelargoniums of Southern Africa (Volume 3). *Annals of Kirstenbosch Botanic Gardens* **16**. National Botanic Gardens, Kirstenbosch.

Characteristic features are: the very abundant 1-2 celled stiff clothing hairs of the lamina, up to 800µ in length, polygonal in transverse section at the base and tapering to an acute apex; the abundant glandular hairs of the lamina, with 3-4 celled stalk and unicellular head, up to 40µ in diameter, filled with yellow-brown contents; the abundant unicellular short clothing hairs, up to 80µ long; the occasional yellow-brown pollen grains, up to 24µ in diameter; the calcium oxalate rosette aggregates, up to 24µ in diameter, forming a crystal layer in the leaf mesophyll or loose in the powdered drug.

1-3. Clothing and glandular hairs
4. Pollen grain (up to 24µ in diameter)
5. Calcium oxalate rosette aggregates (up to 25µ in diameter) forming a crystal layer in the leaf mesophyll
6. Cells of leaf epidermis, with sinuate walls

Crude drug

Collected as needed. Texture soft to rough; colour bright green when fresh, odour characteristic aromatic.

Geographical distribution

Figure 4 – distribution map

All three subspecies of *Pelargonium cucullatum* are components of fynbos vegetation of the Western Cape Province. Subspecies *tabulare* is confined to the Cape Peninsula and Saldanha Bay, while subspecies *cucullatum* occurs in coastal areas from Cape Hangklip to Bredasdorp and subspecies *strigifolium* in inland montane habitats from Bain's Kloof to the Hottentot's Holland and Kleinrivier Mountains.

Quality standards

Identity tests

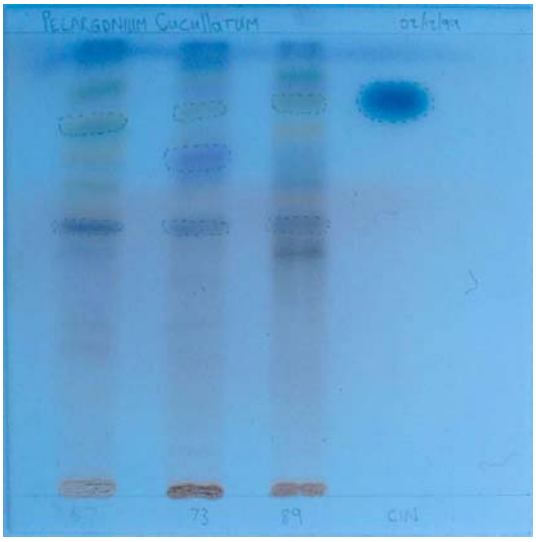


Figure 5 – TLC plate

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: 0,56 (purple-mauve); 0,85 (light green); cineole 0,85 (purple-blue)

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

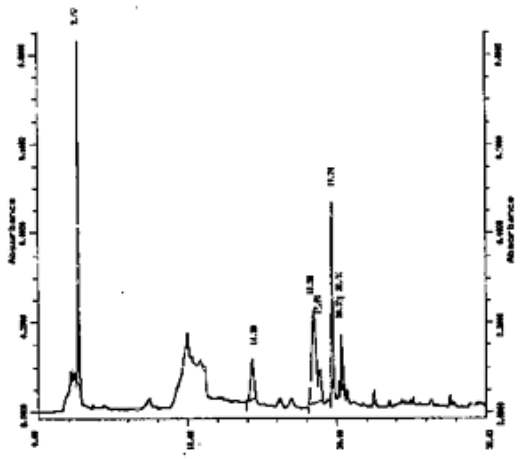


Figure 6 – HPLC spectrum

Major compounds:
Methanol extract: (Figure 6)
Retention times (mins): 2.69; 14.38; 18.50; 18.90; 19.74; 20.44

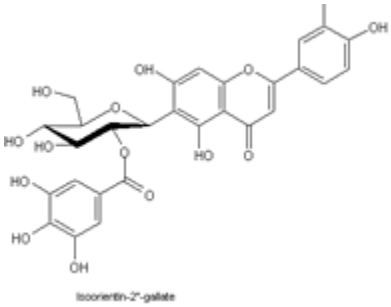
Ethanol (70%) soluble extractive value: not less than 20% (range: 20,73 – 25,65%)

Purity tests

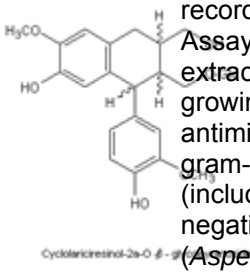
Assay

Not yet available

Major chemical constituents



Isoorientin-2''-gallate



Cyclolariciresinol-2a-O-β-

Figure 7 – chemical constituents

Microchemical tests in our laboratories indicated the presence of saponins and tannins but not of alkaloids nor of cardiac, cyanogenic or anthraquinone glycosides. Coumarins are present in the root[3]. Flavonoids (see Figure 7), lignans and tannins are common in the above ground organs of *Pelargonium* species[4] [5]

(See *Pelargonium betulinum* for summary of genus secondary chemistry)

Dosage forms

Fresh leaves are applied as a dressing to wounds and sores or may be rolled and used as an earplug. An aqueous infusion is taken orally.

Medicinal uses

External

For the relief of earache or as an antiseptic dressing for open sores or wounds.

Internal

For the treatment of colic and diarrhoea.

Pharmacology/bioactivity

Preliminary assays in our laboratories indicated no *in vitro* antimicrobial activity of aqueous extracts of *Pelargonium cucullatum* against *Pseudomonas aeruginosa, Candida albicans* or *Mycobacterium smegmatis,* in the concentrations used. Some activity was recorded against *Staphylococcus aureus.* Assays by other workers, using methanolic extracts of fresh leaf[6] of cultivated plants growing in Britain, demonstrated weak antimicrobial activity against a range of gram-positive and gram-negative bacteria (including *Staphylococcus aureus*) and negative activity against one fungal species (*Aspergillus niger*). In the same study, weak antioxidant activity was recorded, as evidenced by inhibition of β-carotene oxidation by methanolic leaf extracts of *Pelargonium cucullatum*.

The essential oil obtained from fresh leaf of cultivated plants growing in Britain inhibited electrically-induced contractions of isolated guinea pig ileum (IC_{50} 0,7 mcg/ml)[7].

Contraindications

None recorded.

Adverse reactions

None known

Precautions

No special precautions

Dosage

One tablespoonful (3.5g) of powdered dried leaf is added to one litre of boiling water and the resultant infusion allowed to stand until cold, then strained.

Adults: Half a teacupful (90ml) three times daily, for colic or diarrhoea.
Children (2-12 years): One-quarter teacupful (45ml) three times daily.

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[3] Wagner, H. and Bladt, S. (1975). Coumarins from South African *Pelargonium* species. *Phytochemistry* **14**:2061-2064.

[4] Bate-Smith, E.C. (1973). Chemotaxonomy of *Geraniuim*. *Botanical Journal of the Linnean Society* **67**: 347-349.

[5] Latté, K-P. (1999). Phytochemische und pharmacologische Untersuchungen an *Pelargonium reniforme* Curt. PhD thesis, University of Berlin.

[6] Lis-Balchin, M. and Deans, S.G. (1996). Antimicrobial effects of hydrophilic extracts of *Pelargonium* species (Geraniaceae). *Letters in Applied Microbiology* **23(4)**: 205-207.

[7] Lis-Balchin, M. , Hart, S. and Roth, G. (1997). The spasmolytic activity of the essential oils of scented pelargoniums (Geraniaceae). *Phytotherapy Research* **11(8)**: 583-584.