GERANIUM INCANUM HERBA

Definition

Geranium Incanum Herba consists of the fresh or dried aerial parts of Geranium incanum Burm. f. var. incanum and var. multifidum (Sweet) Hilliard and Burtt (Geraniaceae).

Synonyms

var. multifidum
Geranium incanum Burm. f. var. b.
G. multifidum Sweet

Vernacular names
vrouebossie, bergtee, horlosies (A), ngope-sethsoha, tlhako (S), tlako (X), mlako (Ts)

Description

Macroscopical

Low, spreading, much branched perennial herb, 100-250mm high, with a long thickened tap root and slender stems; leaves borne on slender petioles, up to 50mm wide × 70mm long, with 3-7 lobes, each lobe pinnatisect, covered with fine silvery-white hairs closely adpressed to the leaf surface; flowers (Sept.-Nov.) white to pale pink with darker veins (var. incanum) or deep magenta-pink (var. multifidum), up to 40mm in diameter, borne on slender pedicels covered with fine hairs; fruit an elongated capsule resembling a stork’s bill.

Figure 1 – Live plant

Figure 2 – line drawing

Microscopical

Characteristic features are: the very numerous unicellular, rigid, thin-walled warty clothing hairs of leaf and stem, up to 500 microns long, adpressed to the leaf and stem surface or loose in the powdered herb; the small glandular trichomes of the leaf, with unicellular stalk and unicellular head up to 20 microns in diameter; the numerous small rosette aggregates of calcium oxalate, up to 16 microns in diameter, forming a crystal layer in the leaf collenchyma; the large rosette aggregates of calcium oxalate, up to 40 microns in diameter, in the parenchyma cells surrounding fibre bundles of leaf and stem, forming a crystal sheath; the vascular tissue of leaf and stem, with red-brown contents; the fairly frequent large golden-brown pollen grains, up to 70 microns in diameter, with warty exine.

1. Unicellular, rigid, thin-walled, warty clothing hairs of leaf and stem, up to 500µ long
2. Cells of upper epidermis showing adpressed hair and underlying palisade layer
3. Glandular trichome of leaf, with unicellular stalk and head up to 20µ in diameter
4. Collenchyma of leaf lamina with underlying thin-walled cells of mesophyll
5. Calcium oxalate rosette aggregates, up to 16µ in diameter, forming a crystal layer in leaf collenchyma
6. Golden-brown pollen grains, up to 70µ in diameter, with warty exine
7. Calcium oxalate rosette aggregates, up to 40µ in diameter, in parenchyma cells surrounding fibre bundles of leaf and stem, forming a crystal sheath

**Crude drug**

Collected as needed or found in the market place as bundles comprising leaf, stem and flower; odour aromatic, texture soft; colour silver-grey.

**Geographical distribution**

Common and widespread on flats, hill slopes and dunes of the Western and Eastern Cape Provinces. Both varieties have been recorded from the Cape Peninsula eastwards to Knysna, but only var. multifidum occurs in the Eastern Cape Province, in coastal districts as far as Port Alfred.

**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: 0,54 (purple-grey); 0,63 (purple-brown); 0,80 (mauve); 0,97 (purple); cineole: 0,77 (blue-purple)

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

**Figure 6 – HPLC spectrum**

Methanol extract: (figure 6)
Retention times (mins): 2.68; 12.17; 14.45; 15.35; 15.89; 16.98

Ethanol (70%) soluble extractive value:
not less than 26.0% (range: 26.49-30.68%)

**Purity tests**

**Assay**
Not yet available

**Major chemical constituents**

**Figure 7 – chemical constituents**

Microchemical tests in our laboratories indicated the presence of tannins and saponins but not of alkaloids nor of cardiac, cyanogenic or anthraquinone glycosides. The detection of tannin confirms the results of earlier studies\(^2\). The presence of the gallitannin geraniin is reported from other members of the genus. Further information regarding the secondary chemistry of this species is lacking.

**Dosage forms**

Used mainly as an aqueous infusion, taken orally.

**Medicinal uses**

An infusion is taken orally to relieve diarrhoea and colic, to treat venereal diseases, as an anthelmintic, to relieve bladder infections in women and for gynaecological problems e.g. dysmenorrhoea, oligomenorrhoea.

**Pharmacology/bioactivity**

No *in vitro* antimicrobial activity of aqueous extracts of *Geranium incanum* against *Pseudomonas aeruginosa*, *Candida albicans* or *Mycobacterium smegmatis* was observed, in the concentrations used for disc assays in our laboratories. Weak activity was noted against *Staphylococcus aureus*.

The results of an investigation of cytotoxicity and antiviral activity of 16 South African plant species \(^3\) showed that aqueous extracts of *Geranium incanum* were cytotoxic at all concentrations used in the assay to HeLa, Vero, Jurkat E6.1, AA-2 and CEM-SS cells. Similar extracts, in a cell culture antiviral assay, were found to reduce the infectivity of both Coxsackie B2 virus and HSV-1. In direct *in vitro* antiviral assays however, extracts were unable, at non-cytotoxic dilutions, to inhibit virus replication. The cytotoxicity of aqueous extracts may possibly be ascribed to the presence of polyphenols (tannins) and account for the use of *Geranium incanum* as an abortifacient.


Contraindications

None recorded.

Adverse reactions

None reported

Precautions

No special precautions.

Dosage

An infusion may be made by adding one quarter teacupful of fresh leaves to one teacupful (180ml) of boiling water. Allow to infuse for 10 minutes, strain and drink warm. As an anthelmintic, one teacupful is taken once daily, on an empty stomach, for 10 days. For the relief of diarrhoea, bladder infection or colic: one teacupful three times daily. If symptoms persist for more than three days, alternative treatment should be sought. For dysmenorrhoea: one teacupful three times daily for 2-3 days as needed.