TARCHONANTHUS CAMPHORATUS HERBA

Definition

Tarchonanthus Camphoratus Herba consists of the fresh or dried leaves of Tarchonanthus camphoratus L. (Asteraceae)

Synonyms

T. abyssinicus Sch. Bip.
T. camphoratus var. litakunensis (DC.) Harv.
T. minor Less.

Vernacular names

Sagewood (E); kanferbos, vaalbos (A); mofahlana (S); mathola (X); mohatlha (Ts); umnqebe (N); igqeba-elimhlope, isidulisehlathi (Z)

Description

Figure 1 – Live plant

Macroscopical

Dioecious shrub or small tree to 6m, with a moderate to strong odour of camphor; leaves alternate, borne on white-felted twigs, variable, 2 × 0.5 – 12 × 5 cm, obovate to lanceolate, upper surface smooth and finely reticulate with minute golden glands over the veinlets; lower surface white-felted, margin entire to denticulate; flowers (Dec-May) cream, borne on discoid heads in terminal or axillary panicles, female 1-3 flowered, male with numerous flowers; fruit a densely white-woolly achene.

Figure 2 – line drawing

Microscopical

Characteristic features are: the polygonal cells of the upper leaf epidermis (1); the very numerous clothing hairs of the lower leaf lamina, up to 4 cells long, thick walled, tapering to an acute apex, with 3-4 short basal cells and 2-3 longer apical cells (3); the glandular trichomes along the veins of the upper leaf surface, with bicellular heads up to 80µ in diameter and yellow-brown contents (2); the thick cuticle of the leaf epidermis (4), staining red with Soudan IV;

Figure 3 – microscopical features

the parenchyma of the leaf mesophyll containing bundles of minute calcium oxalate raphides (5).

**Crude drug**

Bundles of fresh or dried material comprising leafy twigs; texture coarse-leathery, colour grey-green, odour faint camphoraceous.

**Geographical distribution**

Widespread in all provinces of South Africa, in coastal forest, thornveld and thicket; also in Lesotho, Swaziland, Namibia, and north into tropical Africa.

**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. Rf values of major compounds: 0.18 (indigo); 0.59 (grey-mauve); 0.72 (grey-mauve); 0.80 (grey); 0.95 (purple); cineole: 0.83 (purple)

**Figure 5 – TLC plate**

HPLC on C\textsubscript{18} column, method according to Appendix 2b.

**Major compounds:**

Methanol extract: (figure 6a)
Retention times (mins): 10.72; 18.17; 18.93; 20.54; 20.78; 26.15; 26.66

**Figure 6 a – MeOH HPLC spectrum**

DCM extract: (figure 6b)

**Figure 6 b – DCM HPLC spectrum**
Retention times (mins): 1.29; 2.20; 4.37; 4.51; 5.64

Ethanol (70%) soluble extractive value: not less than 21.7% (range: 21.74-29.82%)

**Purity tests**

**Assay**

Not yet available

**Major chemical constituents**

![Chemical Constituents](image)

**Figure 7 – chemical constituents**

Phytochemical tests in our laboratories indicated the presence of tannins, saponins (2/3 collections) and reducing sugars (2/3 collections), but not of alkaloids, nor of cardiac or anthraquinone glycosides.

Analyses of the leaf oil (yield: 0.76%V/W) of Kenyan plants identified α-fenchyl alcohol (29.1%), 1,8-cineole (eucalyptol: 16.5%) and α-terpineol (8.5%) as the major constituents. Camphor was present in only minor quantity (0.4%) 

Various flavones (e.g. luteolin, apigenin, nepetin and hispidulin) have been identified in Egyptian collections of this species, as has the sesquiterpene lactone parthenolide as well as a quaternary alkaloid, tarchonanthine.

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**Dosage forms**

The leaves of *Tarchonanthus camphoratus* are utilised in a number of ways: infusions, tinctures or decoctions are taken orally and the vapours from burning green material either inhaled or directed as a fumigant to inflamed joints; fresh leaf may chewed or smoked; a leaf poultice may be applied to the chest and an ointment to affected areas.

**Medicinal uses**

Despite its wide geographical distribution, the medicinal uses to which this species is put are remarkably similar throughout its range. It is taken orally or applied externally to relieve bronchitis, asthma, headache, inflammation, chilblains or abdominal pains. Leaf infusions have also been reported to be diaphoretic.

**Pharmacology/bioactivity**

No *in vitro* activity against *Staphylococcus aureus, Pseudomonas aeruginosa, Candida albicans* or *Mycobacterium smegmatis* was shown by aqueous leaf extracts used in preliminary assays for antimicrobial activity in our laboratories.

A more recent investigation of antimicrobial activity of aqueous, ethanolic and hexane extracts of dried leaf did not demonstrate *in vitro* inhibitory effects against *Staphylococcus aureus, Bacillus subtilis, Escherichia coli* or *Klebsiella pneumoniae*.

Aqueous leaf extracts administered i. p. to mice at a dose of 50-100mg/kg were shown to significantly attenuate pain in the acetic acid writhing test. At a dose of 100mg/kg, pain was significantly antagonised in the hot plate test. The same study was able to demonstrate that an aqueous extract (100mg/kg) significantly reduced fever induced in the rat by bacterial endotoxin.

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5 Amabeoku, G.J., Green, I., Eagles, P. and Benjeddou, M. (2000). Effects of *Tarchonanthus camphoratus* and *Eriocephalus africanaus* on
Contraindications
None known

Adverse reactions
None recorded

Precautions
No special precautions

Dosage
To be determined

nociception in mice and pyrexia in rats.
*Phytomedicine* 7(6): 517-522