

EUCLEA UNDULATA HERBA

Definition

Euclea Undulata Herba consists of the fresh or dried leaves of *Euclea undulata* Thunb. var. *myrtina* (Burch.) Hiern and var. *undulata* (Ebenaceae).

Synonyms

E. myrtina Burch.

E. undulata Thunb.

Vernacular names

Ghwarrie (Afr.), guarri, umgwali (Xh.); mokoerekoere (Se.); gwanxe, inkunzane, umshekizane, umbophanyamazane (Z); ihlangula (Sd)

Description¹

Macroscopical



Figure 1 – Live plant

alternate, leathery-granular in texture, often rust-coloured when young due to the presence of red-brown glands, entire, obovate to oblanceolate, with undulate margin; **flowers** (Dec-Apr) white to cream, fragrant, borne in axillary racemes of 5-7 individuals, ovary scaly; **fruit** a globose fleshy berry 4-6mm in diameter, red becoming purple or black when ripe.



Figure 2 – line drawing

Erect dense twiggy evergreen dioecious shrubs, 0.75-5m high, or trees to 7m high, stem or trunk 2-15 cm in diameter, bark grey scaly; branchlets much divided and densely covered with leaves; **leaves** subopposite to

¹ De Winter, B. (1963). The genus *Euclea*. Flora of Southern Africa **26**: 82-99.

Microscopical

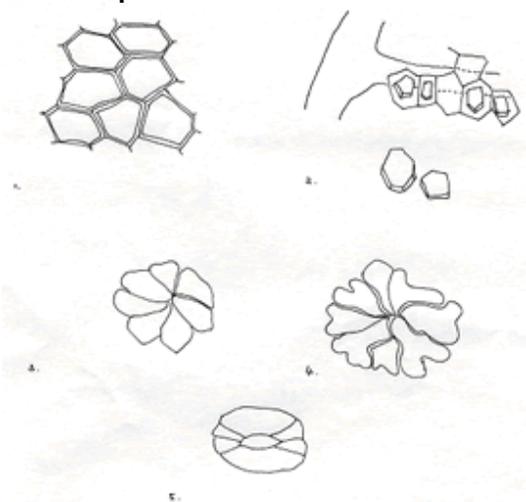


Figure 3 – microscopical features

Characteristic features are: the very numerous leaf and stem scales, up to 600 μ in diameter, with yellow-brown contents, loose in the powdered herb (3-5); the partial crystal sheath of calcium oxalate prisms, each up to accompanying the main and subsidiary veins of the leaf lamina (2); the polygonal thick-walled cells of the leaf epidermis (1)

Crude drug

Leafy twigs, the stems rust brown and foliage pale green when young, becoming glabrous and darker green respectively with age. Texture rough-leathery, odour faint pleasant, taste intensely astringent.

Geographical distribution

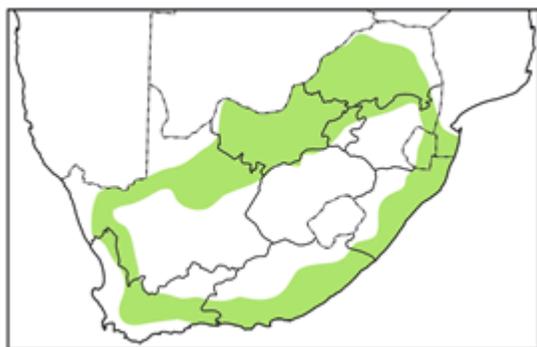


Figure 4 – distribution map

Widespread on rocky slopes in all provinces except the Free State; var. *undulata* occurs from Worcester in the Western Cape

Province to Komga in the Eastern Cape while var. *myrtina* (small leaved ghwarrie) is found in Namibia, the Northern Cape, Northwest and Northern Provinces, entering KwaZulu-Natal through Mpumalanga and Swaziland.

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: 0.34 (grey); 0.45 (purple); 0.49 (mauve); 0.54 (grey); 0.63 (purple); cineole: 0.78 (blue-purple)

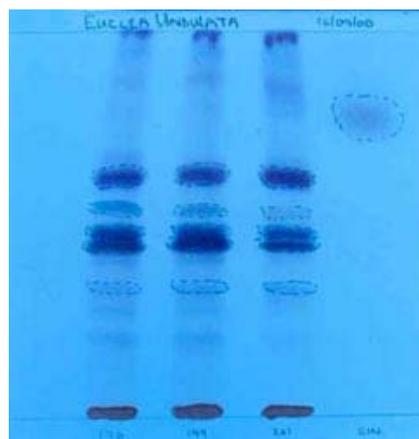


Figure 5 - TLC plate

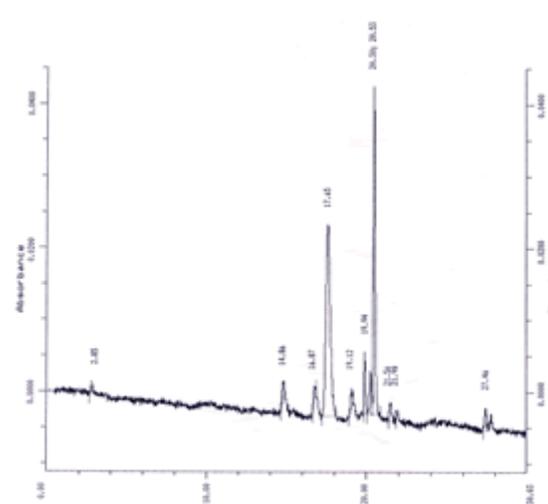


Figure 6 – HPLC spectrum

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

Major compounds:

Methanol extract: Retention times (mins):
18.6; 19.39

Ethanol (70%) soluble extractive value: not
less than 32.0% (range: 32.05-38.82%)

Purity tests

Assay

Not yet available

Major chemical constituents

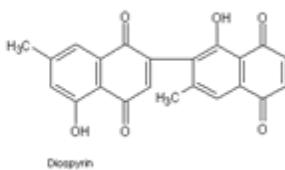
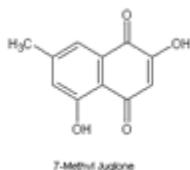


Figure 7 – chemical constituents

Studies on the phytochemistry of *Euclea* species have identified triterpenoids and aliphatics in branches and leaf^{2 3} and naphthoquinones in root, stem and fruit^{4 5}. In the latter study, the naphthoquinones 7-methyl-juglone (a) and diospyrin (b) were isolated from the roots and isodiospyrin from the fruits of *Euclea undulata* var. *myrtina*. Stems appeared devoid of naphthoquinones; leaves were not included in the survey. Chemical tests in our laboratories indicated the presence in leaf and stem of tannins, saponins and reducing sugars, but not of alkaloids nor of anthraquinone or cardiac glycosides. Bark is reported to contain 3.26% of tannin^{GR1}.

Dosage forms

An aqueous infusion, made with cold water, is taken orally or used as a gargle.

Medicinal uses

Leaf preparations are taken orally in the Western Cape to treat diarrhoea and disorders of the stomach, and as a gargle to relieve tonsillitis^{GR20}. Elsewhere in the country root infusions are used as enemata or as an ingredient of *inembe* (medication taken regularly during pregnancy to ensure a trouble-free confinement)^{GR12}. The use of root preparations to induce emesis or purgation is also recorded^{GR11} and of bark preparations for the treatment of headache, toothache and other pains^{GR1}

Pharmacology/bioactivity

In vitro antimicrobial activity against *Staphylococcus aureus* was demonstrated in our laboratories by aqueous extracts prepared from dried leaf material, at a concentration of 40mg/ml. This result, together with the demonstrated presence of tannins in the leaves of this species, supports its use as an anti-diarrhoeal and for the relief of tonsillitis. No activity against *Pseudomonas aeruginosa*, *Candida albicans* or *Mycobacterium smegmatis* was shown by preliminary tests. No other information is available regarding the bioactivity of this species. In a study of the *in vitro* activity of a number of indigenous species used as traditional medicines against *Mycobacterium tuberculosis*, root extracts of *Euclea natalensis* showed inhibitory activity⁶.

Contraindications

As both anti-diarrhoeal and purgative actions are reported for this species, dosage and method of preparation require standardisation. Its use as an anti-diarrhoeal by pregnant women and children is not for the present recommended.

² Orzalesi, G., Mezzetti, T., Rossi, C. and Bellavita, V. (1970-71). *Planta Medica* **19**: 30-36. Cited in 4 below.

³ Costa, M.A.C., Paul, M.I., Alves, A.A.C. and van der Vyver, L.M. (1978). Aliphatic and triterpenoid compounds of Ebenaceae species. *Rev. Port. Farm.* **28**(3): 171-174.

⁴ Van der Vyver, L.M. and Gerritsma, K.W. (1973). Naphthoquinones of *Euclea* and *Diospyros* species. *Phytochemistry* **12**: 230-231.

⁵ Van der Vyver, L.M. and Gerritsma, K.W. (1974). Naphthoquinones of *Euclea* and *Diospyros* species. *Phytochemistry* **13**: 2322-2323.

⁶ Lall, N. and Meyer, J.J.M. (1999). *In vitro* inhibition of drug-resistant and drug-sensitive strains of *Mycobacterium tuberculosis* by ethnobotanically selected South African plants. *Journal of Ethnopharmacology* **66**: 347-354.

Adverse reactions

None reported

Precautions

None known

Dosage

Adults: one teacupful (180ml) of a cold water infusion three times daily ^{GR 20}.

