

OCOTEA BULLATA CORTEX

Definition

Ocotea Bullata Cortex consists of the dried bark of *Ocotea bullata* (Burch.) Baill. (Lauraceae).

Synonyms

Vernacular names

Umnukane (Z, Xh.), black stinkwood, stinkhout (A)

Description

Macroscopical ^{GR26}



Figure 1: Fresh bark

Evergreen tree, to 30m in height in favourable sites, with straight trunk developing fluting and buttresses when mature; **leaves** alternate, long stalked, simple, entire, glabrous, broadly elliptic, 7-14 cm long, glossy green, thinly leathery with undulate margin and characteristic pits (bullae) in the axils of the main veins, usually near the base of the leaf; young leaves and petioles often reddish; **flowers** (Dec-Jan) borne in loose bunches in leaf axils, small, cream to greenish-yellow; **fruits** (Mar-Jun) acorn-like berries, yellow-green to purple when ripe, 1-1.5 cm long, thinly fleshy with a large soft stone.



Figure 2: line drawing

Microscopical

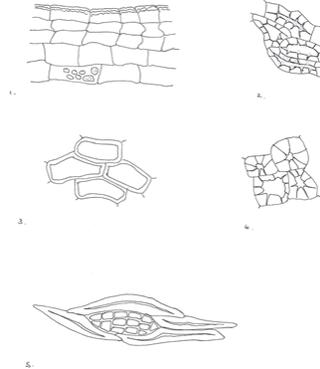


Figure 3: microscopical features

Characteristic features are: abundant cork tissue (1), the cells with reddish-brown contents; the collenchyma of the cortex (3), the cells with thick yellow-brown walls; bundles of thick-walled fibres of the secondary phloem, staining deep pink with phloroglucinol/HCl (5); the fairly abundant round starch granules, up to 10 μ in diameter, occurring in clumps in the cortical parenchyma (1); sclereids occurring in groups below the cortical collenchyma, staining with phloroglucinol/HCl (2+4); the oil cells of the inner bark, bright yellow in young bark, darker yellow-brown in older bark.

Crude drug

Found in the marketplace as nearly flat to curved pieces 5-10mm thick. When young, the outer surface is smooth and grey with white and pale orange patches, transverse ridges and corky spots, the inner surface smooth and red-brown in colour; with age the bark becomes dark grey-brown, rugged and flaky on the exterior with lichens often present, while the interior is rough-fibrous and light grey-brown. The scent, particularly of freshly gathered bark, is pleasant and characteristic-aromatic.

Geographical distribution

Wide distribution in afro-montane forest from the Cape Peninsula eastwards to KwaZulu/Natal and Mpumalanga, with a gap in the Eastern Cape Province. This species

is most abundant on moist sites of the southern Cape forests, where it was formerly much exploited for timber. Demand for bark for medicinal use has resulted in extensive illegal stripping of trees throughout the species' range by commercial harvesters. It has been declared endangered and enjoys special protection in KwaZulu/Natal.

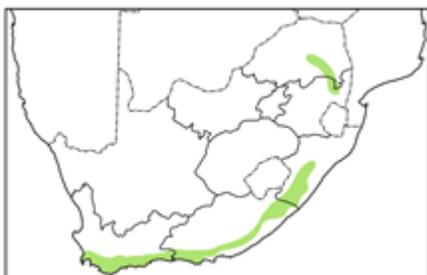


Figure 4: distribution map

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: 0.50 (grey-brown); 0.63 (mauve); 0.72 (purple-brown); 0.83 (purple); cineole: 0.79 (blue-purple)

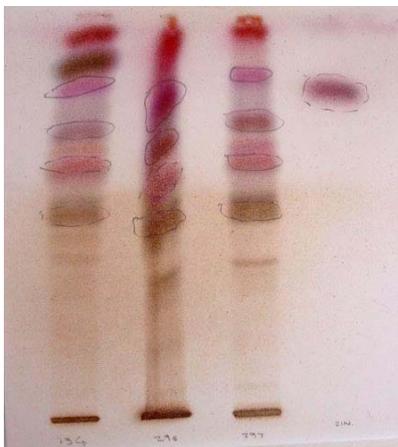


Figure 5: TLC plate

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

Major compounds:

Methanol extract:

Retention times (mins): 9.69; 10.04; 10.75; 11.30

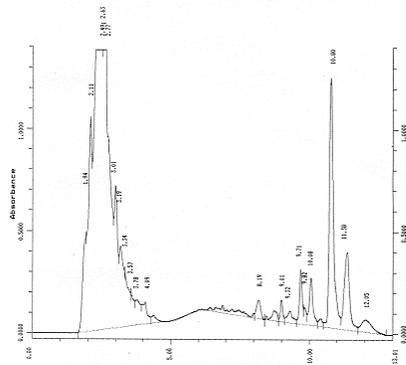


Figure 6: HPLC spectrum

Ethanol (70%) soluble extractive value: not less than 25.0% (range: 25.22-36.44%)

Purity tests

Assay

Not yet available

Major chemical constituents

Various neolignans have been isolated from (and are considered to be the major components of) the stem bark of *Ocotea bullata*^{1,2}. These include ocobullenone, iso-ocobullenone, sibyllenone³ (a diastereomer of ocobullenone) and a neolignan ketone thought to be a precursor to the ocobullenones (figure 7). These compounds have been found to occur also in the related indigenous *Cryptocarya liebertiana* (Lauraceae), but not in other *Cryptocarya* species⁴ of which the bark is often used as a

¹ Sehlapelo, B., Drewes, S.E. and Sandor, P. (1993). Ocobullenone, a bicyclo[3.2.1.] octanoid neolignan from *Ocotea bullata*. *Phytochemistry* **32(5)**: 1352-1353.

² Drewes, S.E., Horn, M.M., Sehlapelo, B.M., Ramesar, N., Field, J.S., Scott Shaw, R. and Sandor, P. (1995). Iso-ocobullenone and a neolignan ketone from *Ocotea bullata*. *Phytochemistry* **38(6)**: 1505-1508.

³ Zschocke, S., van Staden, J., Paulus, K., Bauer, R., Horn, M.M., Munro, O.Q, Brown, N.J. and Drewes, S.E. (2000). Stereostructure and anti-inflammatory activity of three diastereomers of ocobullenone from *Ocotea bullata*. *Phytochemistry* **54**: 591-595.

⁴ Drewes, S.E., Horn, M.M. and Mavi, S. (1997). *Cryptocarya liebertiana* and *Ocotea bullata* – their phytochemical relationship. *Phytochemistry* **44(3)**: 437-440.

substitute for *Ocotea bullata*, on account of the scarcity of the latter. Phytochemical tests in our laboratories indicated the presence of tannins (previously recorded at levels of 3-6%^{GR1})

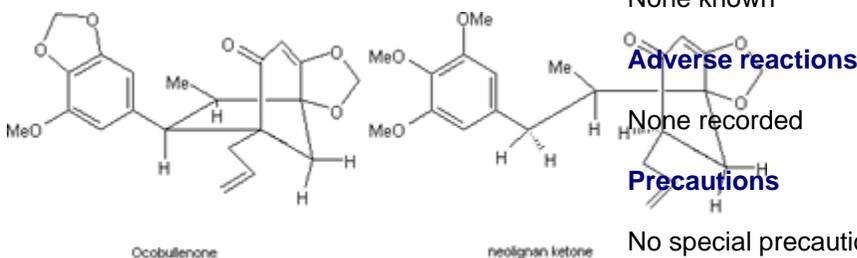


Figure 7: chemical constituents

Dosage forms

Ground bark is used as a snuff, or ignited and the fumes inhaled; aqueous infusions are taken orally.

Medicinal uses

This species is highly regarded as a specific for headache. Mixed with other herbs, it has been used to treat infections of the male urinary tract.

Pharmacology/bioactivity

Preliminary studies have indicated moderate activity of crude bark extracts in a cyclooxygenase (COX-1) assay⁵ and further work by the same group has focused on identifying which of the four known neolignans might be responsible for the observed anti-inflammatory effects. None of the four neolignans had any inhibitory effects in either COX-1 or COX-2 test systems, but inhibition of 5-lipoxygenase (5-LO) was shown by ocobullenone and sibyllinone. Of the two compounds, the latter showed good 5-LO activity (IC₅₀ 18.6µM), while ocobullenone (IC₅₀ ca. 100µM) had only a moderate inhibitory action.

Water, hexane and 100% ethanol extracts of dried root, assessed for *in vitro* antibacterial activity against *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Bacillus subtilis* and

Escherichia coli, were found to be inactive in the concentrations used⁶.

Contraindications

None known

Adverse reactions

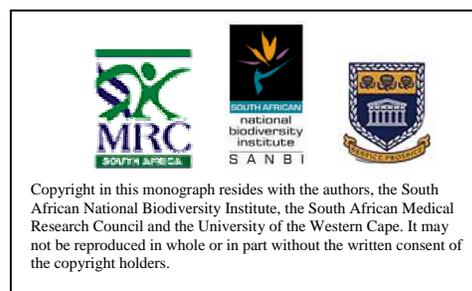
None recorded

Precautions

No special precautions

Dosage

To be determined



⁵ Jäger, A., Hutchings, A. and van Staden, J. (1996). *Journal of Ethnopharmacology* **52**: 95.

⁶ Mc Gaw, L.J., Jager, A.K. and van Staden, J. (2000). Antibacterial, anthelmintic and anti-amoebic activity of South African medicinal plants. *Journal of Ethnopharmacology* **72(1/2)**: 247-263.