

**Cinnamomi cortex** (DAB 10, Ph. Eur. 2), Cinnamon (*BAN, USAN*; BP 1988), Cinnamomon, Ceylon

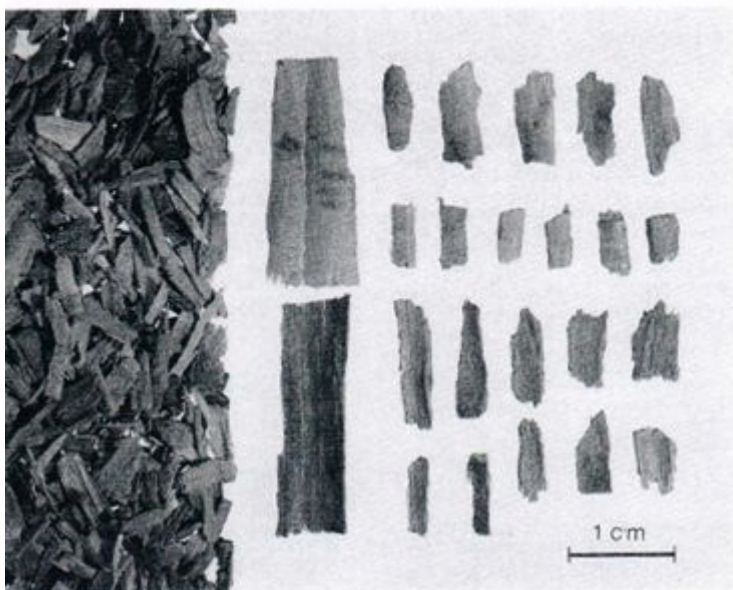


Fig. 1: Cinnamon

The drug consists of the dried bark of the shoots of coppiced trees, freed from the outer cork and underlying parenchyma by scraping.

**Description:** The mass pieces of bark, 0.2-0.7 mm thick and in the form of single or double compound quills, are light brown on the outside and somewhat darker on the inside; the surface is longitudinally striated and the fracture is short and splintery. See further [1].

**Odour:** Characteristic and pleasantly aromatic.

**Taste:** Pungently spicy, somewhat sweet and mucilaginous, and only slightly sharp.



Fig. 2: *Cinnamomum* sp. NEES

Densely leafy, evergreen trees, up to 10 m tall, in plantations mostly kept as bushes by coppicing. Bark taken from the 2-3 cm thick branches of ca. 6-year old trees or from ca. 2-year old root suckers of older plants.

Fig. 3: *Cinnamomum* sp. NEES

Stout, leathery, ovate-lanceolate, and acuminate leaves, up to 20 cm long, with arcuate main veins; on rubbing, smelling of cloves. Flowers, ca. 0.5 cm in diameter and silky-haired, arranged in loose panicles.

DAB 10: Zimtrinde  
 OAB: Cortex Cinnamomi ceylanici  
 Ph. Heb. VII: Cinnamomi cortex  
 St.Zal. 1709.99.99 (Zimt)

**Plant source:** *Cinnamomum verum* J. PRESL (syn. *C. zeylanicum* GARCIN ex BLUME, according to the Ph. Eur. 2, etc.; *C. zeylanicum* NEES), Ceylon cinnamon (Lauraceae).

**Synonyms:** Cinnamomum, Cinnamon bark (Engl.), Zimtrinde, Echter Kanel (Ger.), Cannellier de Ceylan, Écorce de cannellier de Ceylan (Fr.).

**Origin:** Native to Sri Lanka (?); cultivated in Sri Lanka, the Seychelles, south-eastern India, Indonesia, the West Indies, and South America. The drug is imported mainly from Sri Lanka, but also Malaysia, Madagascar, and the Seychelles.

**Constituents:** 0.5–2.5% Essential oil, the main components of which are cinnamaldehyde (65–80%), eugenol, and *trans*-cinnamic acid (5–10%); in addition, other phenylpropanes, including hydroxycinnamaldehyde, *o*-methoxycinnamaldehyde, cinnamyl alcohol and its acetate, and terpenes, among them limonene,  $\alpha$ -terpineol; also, tannins, mucilage, oligomeric procyanidins, and traces of coumarin [2–5].

**Indications:** Occasionally, in combination with other drugs, as a stomachic and carminative.

However, the drug is used primarily as a taste enhancer and as a spice, and to some extent also in the preparation of liqueurs. In *folk medicine*, the essential oil is used drop-wise ("cinnamon drops") as a remedy in dysmenorrhoea and as a haemostyptic. The essential oil has antimicrobial and fungicidal properties [4], which are probably due to the *o*-methoxycinnamaldehyde content.

Extract from the German Commission E monograph (BAnz no. 22a, dated 01.02.1990)

**Uses**

Lack of appetite; dyspeptic complaints such as mild, colicky upsets of the gastrointestinal tract, a feeling of distension, and flatulence.

**Contraindications**

Allergy to cinnamon or Peru balsam. Pregnancy.

**Side effects**

Often, allergic reactions by the skin and mucous membranes.

**Interactions with other remedies**

None known.

**Dosage**

Unless otherwise prescribed: daily dose, 2–4 g drug or 0.05–0.2 g essential oil; preparations correspondingly.

**Mode of administration**

Pulverized drug for infusions; essential oil and other galenic preparations for internal use.

**Effects**

Antibacterial, fungistatic, motility-stimulating.

**Side effects:** None, when properly used. In large amounts, cinnamon bark (and in moderate doses, cinnamon oil) bring about tachycardia and increased intestinal peristalsis, respiration, and perspiration, through stimulation of the vasomotor centre; this excitation state follows a central sedative phase characterized by sleepiness and depression [5].

**Making the tea:** Not very usual; see the Standard Licence.

**Herbal preparations:** The drug is a component of herbal mixtures for different indications, as well as of mixtures for making mulled wine (Glühwein), and is also available in tea bags.

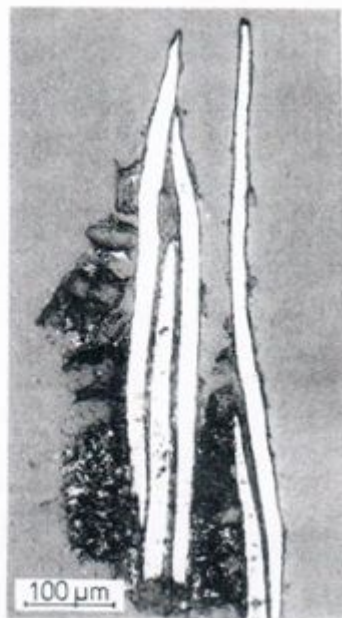


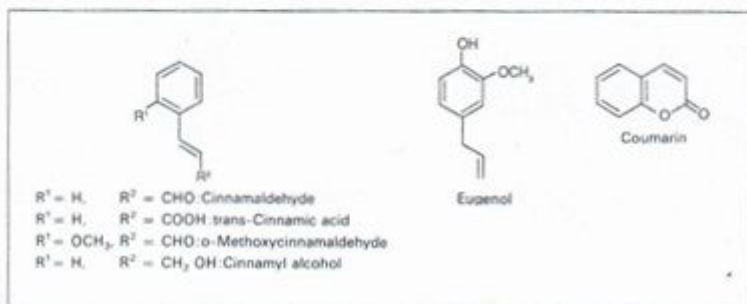
Fig. 4: Thick-walled phloem fibres and very fine calcium oxalate needles in the adjacent parenchyma (in polarized light)

**Phytomedicines:** Cinnamon bark is included in some prepared remedies, especially stomachics and carminatives, mainly to improve the taste and as an aromatic.

**Regulatory status (UK):** General Sales List – bark and oil: Schedule 1, Table A.

**Authentication:** Macro- (see: Description) and microscopically. The drug contains long, slender phloem fibres (Fig. 4) which shine in polarized light, very fine needles of calcium oxalate in the parenchyma, and stone cells that are mostly thickened all round. Cork or lignified cork should be absent, but if present it points to adulteration with Chinese cinnamon. For the detailed microscopy of powdered Ceylon cinnamon, see [6].

The TLC examination for purity given in the Ph. Eur. 2, BP 1988, etc. (q.v.), is also a proof of identity, based on the detection of the characteristic substances: cinnamaldehyde, eugenol, and *o*-methoxycinnamaldehyde:



**Test solution:** 0.1 g pulverized drug shaken for 15 min. with 2 ml dichloromethane, filtered, the filtrate taken almost to dryness on the water-bath, and the residue dissolved in 0.4 ml toluene.

**Reference solution:** 50 µl cinnamaldehyde and 10 µl eugenol made up to 10 ml in toluene.

**Loadings:** 10 µl of each solution, as 2-cm bands on silica gel GF<sub>254</sub>.

**Solvent system:** dichloromethane, 10 cm run.

**Detection:** in UV 254 and 365 nm light, both quenching and fluorescent zones marked.

**Evaluation:** in UV 254 nm light. **Reference and Test solutions:** in the middle, a quenching zone (cinnamaldehyde) and directly above it a weak quenching zone (eugenol). In UV 365 nm light. **Test solution:** just below the cinnamaldehyde zone, a bright blue fluorescent zone (*o*-methoxycinnamaldehyde); sprayed with dianisidine (2.5 g in 10 ml 98% acetic acid), the cinnamaldehyde zone becomes yellowish brown.

On the TLC, adulterants containing more than 0.03% coumarin (pharmaceutical cinnamon bark has less than 0.0008%) exhibit an intense green fluorescent zone at Rf ca. 0.28, just below the one belonging to *o*-methoxycinnamaldehyde at Rf ca. 0.35.

**Quantitative standards:** Ph. Eur. 2; Volatile oil, not less than 1.2%. Sulphated ash, not more than 6.0%.

*Wording of the package insert, from the Standard Licence:*

**7.1 Uses**

Complaints such as a feeling of distension, flatulence, and mild cramp-like gastrointestinal disorders, e.g. resulting from reduced production of gastric juice.

**7.2 Contraindications**

Preparations of cinnamon are not to be used if stomach or intestinal ulcers are present or during pregnancy.

**7.3 Dosage and Mode of administration**

Hot water (ca. 150 ml) is poured over a small teaspoonful (0.5–1 g) of Cinnamon and after 10 min. passed through a tea strainer.

Unless otherwise prescribed, a cup of the infusion is drunk two or three times a day during meals.

**7.4 Note**

Store protected from light and moisture.

**Adulteration:** Occurs, especially with the powdered drug. It involves the bark of other *Cinnamomum* species: *C. aromaticum* NRES (syn. *C. cassia* BLUME), Cassia, cassia bark, cassia lignea, Chinese or bastard cinnamon, is distinguished by being much thicker (1–2 mm) and having a cork, the inner part of which comprises thick-walled cells. Large numbers of cork cells and groups of such cells are also typical of adulteration with insufficiently scraped cinnamon or by scrapings. For the detailed microscopy of powdered cassia bark, see [6].

Another adulterant, Padang cinnamon (also known as Java or Indonesian cinnamon), which comes from *C. burmanii* has plates of

calcium oxalate in the cells of the medullary rays, unlike Ceylon cinnamon.

To distinguish Chinese and Ceylon cinnamon, the reaction of the powder with barium water can be used. A specimen of each drug is placed on a microscope slide and moistened with 2–3 drops of 10% aqueous barium hydroxide solution; after 1–2 min., different fluorescence colours are observed when examined under UV 365 nm light. Chinese cinnamon exhibits an intense yellowish green fluorescence, some fibres are bright yellowish, while others are light blue to bluish violet, and the parenchyma appears dark reddish brown. Ceylon cinnamon shows a pale, bluish green colour; the fibres and parenchyma have the same fluorescence colours as the Chinese cinnamon. For the TLC detection of adulterants on the basis of a too high content of coumarin, see Authentication.

**Storage:** Protected from light and moisture in well-closed metal or glass (but not plastic) containers.

**Literature:**

- [1] W.C. Evans, Trease and Evans' Pharmacognosy, 13th ed., Baillière Tindall, London-Philadelphia-Toronto-Sydney-Tokyo, 1989, p. 453.
- [2] Kommentar DAB 10.
- [3] V. Formáček and K.-H. Kubeczka, Essential oil analysis by capillary gas chromatography and carbon-NMR spectroscopy, Wiley, Chichester, 1982.
- [4] S. Morozumi, Appl. Environ. Microbiol. **4**, (1973).
- [5] Hager, vol. **4**, p. 54 (1973); vol. **4**, 894 (1992).
- [6] B.P. Jackson and D.W. Snowden, Atlas of microscopy of medicinal plants, culinary herbs and spices, B. Raven Press, London, 1990, pp. 50 (*C. aromaticum*, *C. cassia*), 62 (*C. verum* = *C. zeylanicum*).