

**Anisi fructus** (DAB 10), Aniseed (Ph. Eur. 2, BP 1988)

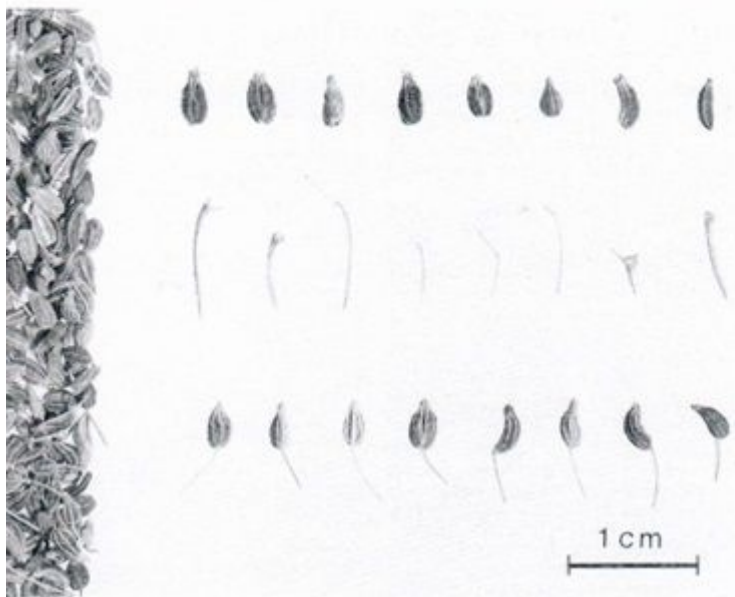


Fig. 1: Aniseed (middle row, parts of the stem and remains of the carpophore)

**Description:** The drug consists of the ca. 2 mm long, greyish green to greyish brown, finely ridged and finely pubescent (Fig. 4), obpyriform and laterally somewhat compressed, stalked cremocarps (double achene). The mericarps have five more or less straight ridges.

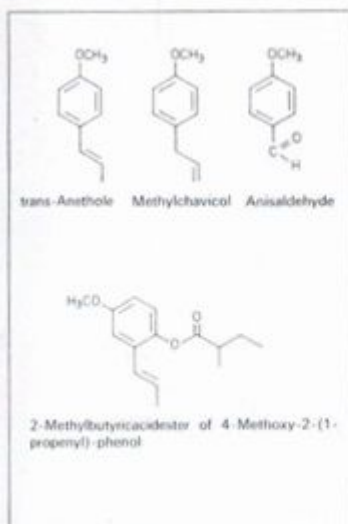
**Odour:** Reminiscent of anethole.

**Taste:** Sweetish, aromatic (aniseed-like).



Figs. 2 and 3: *Pimpinella anisum* L.

Herbaceous plants, 30-60 cm tall, with basal leaves undivided and leaves towards the top increasingly pinnatisect. Compound umbels with 7-15 rays and mostly without bracts.



DAB 10: Anisi  
Ph. Heb. VII: Anisi fructus  
ÖAB: Fructus Anisi  
St.Zal.: 8099.99.99

**Plant source:** *Pimpinella anisum* L. (Apiaceae).

**Synonyms:** Semen Anisi, Semen Absinthii dulcis (Lat.), Pimpinella, Anise (Engl.), Anis, Kleiner Anis, Süßer Kümmel (Ger.), Anis vert, Fruit d'anis (Fr.).

**Origin:** Presumed to be native in the eastern Mediterranean region and western Asia; cultivated in southern Europe, the Mediterranean region, the Middle East, India, the former USSR, and in Mexico and Chile; imports come from Turkey, Egypt, and Spain.

**Constituents:** Main constituent: 1.5-5% essential oil, with *trans*-anethole (80-90% of the oil) chiefly responsible for the taste and smell. Also, the isomeric methylchavicol (*trans*-isomer) (1-2%), which, although smelling like anise, does not taste sweet, and anisaldehyde (<1%); further, sesquiterpene hydrocarbons (especially  $\gamma$ -himachalene, ca. 2% [2]) and less than 1% monoterpene hydrocarbons (difference with the oil from *Illicium verum* Hook. f.) [1-3]. The dimers of anethole (*dianethole*) and anisaldehyde (*dianisoin*) repeatedly mentioned in the litera-

ture and supposedly responsible for the oestrogenic activity in old drugs, could not be found after thorough investigation [4]. Characteristic of *genuine* aniseed oil is the presence of up to 5% of the 2-methylbutyryl ester of 4-methoxy-2-(1-propenyl)-phenol (= pseudoisoeugenyl 2-methylbutyrate) [2, 3]. In addition, aniseed contains fat and coumarins [5].

**Indications:** As an expectorant and carminative, on account of the secretolytic, spasmolytic, and secretomotor effects of its essential oil; like fennel, it is often used in paediatric practice [1, 6, 7]. In high doses, as an antispasmodic and antiseptic.

In *folk medicine* also as an emmenagogue, lactagogue (oestrogenic action?), and aphrodisiac. The essential oil is used externally (in a fatty-oil or ointment vehicle) as a stimulating liniment and against vermin. Aniseed and aniseed oil are also employed in the food and drink industry as flavour enhancers, e.g. in ouzo (Greek aniseed spirits), pastis, anisette (French aniseed drinks), and as an ingredient of Bénédictine, Boonekamp, Danziger Goldwasser, etc.

**Making the tea:** 1-5 g of the seeds, pounded or coarsely powdered immediately before use, is covered with boiling water and allowed to draw in a closed vessel for 10-15 min.

1 Teaspoon = ca. 3.5g.

**Herbal preparations:** Several instant teas as powders containing aqueous extracts of aniseed, or as a tea paste, some preparations with micro-encapsulated aniseed oil.

**Phytomedicines:** As a constituent of numerous cough remedies (antitussives, expectorants), stomach and bowel remedies (carminatives, laxatives), especially in paediatric practice, in the form of teas, tea extracts, dragees, and sweets; often together with other essential-oil drugs, such as fennel.

**Regulatory status (UK):** General Sales List - Schedule 1, Table A (anise oil).

**Authentication:** Macro- (see: Description) and microscopically, following the DAB 10; see: Fig. 5. The diagnostic features of the powdered drug are described in [10]. The Ph. Eur. 2 (BP 1988, etc.) monograph includes the following TLC test of identity:

**Test solution:** 0.1g powdered drug shaken for 15 min. with 2 ml dichloromethane, filtered, solvent carefully evaporated at ca. 60 °C, and the residue dissolved in 0.5 ml toluene.

**Reference solution:** 3  $\mu$ l anethole and 40  $\mu$ l olive oil dissolved in 1 ml toluene.

Extract from the German Commission E monograph (BANZ no. 122, dated 06.07.1988)

#### Uses

Internally: dyspeptic complaints. Internally and externally: catarrh of the respiratory tract.

#### Contraindications

Allergy to aniseed and anethole.

#### Side effects

Occasional allergic reactions of the skin, respiratory tract, and gastrointestinal tract.

#### Interactions with other remedies

None known.

#### Dosage

Unless otherwise prescribed: Internally: average daily dose, 3.0 g drug or 0.3 g essential oil; preparations correspondingly. Externally: preparations with 5-10% essential oil.

#### Mode of administration

Powdered drug for infusions and other galenic preparations for internal use or for inhalation.

**Warning:** The purpose of the external use of aniseed preparations must be inhalation of the essential oil.

#### Effects

Expectorant, weakly spasmolytic, antibacterial.

**Loadings:** 2  $\mu$ l and 3  $\mu$ l of the test solution and 1  $\mu$ l, 2  $\mu$ l, and 3  $\mu$ l of the reference solution, at 2-cm intervals on silica gel GF<sub>254</sub>.

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

**Detection and Evaluation:** in UV 254 nm light. Reference and Test solutions: dark spots in the centre part corresponding to anethole.

Sprayed with 20% phosphomolybdic acid in 96% ethanol, followed by heating a 120 °C for 5 min. Test solution: with the 2  $\mu$ l loading of the test solution: anethole, a blue zone against a yellow background intermediate in size between the 1  $\mu$ l and 3  $\mu$ l zone of the reference solution; a blue zone, due to triglycerides, in the lower third of the chromatogram at about the same Rf as the blue zone of the olive-oil triglycerides.

The TLC can also be carried out according to the methods in [1, 8].

**Quantitative standards:** Ph. Eur. 2: Volatile oil, not less than 2.0%. Foreign matter, not more than 2%. Water, not more than 7.0%. Acid-insoluble ash, not more than 2.5%. Sulphated ash, not more than 12.0%.

BHP 1983: Volatile oil, not less than 2.0%. Foreign organic matter, not more than 2%; other fruits and seeds, not more than 2%. Total ash, not more than 10%. Acid-insoluble ash, not more than 2.5%.

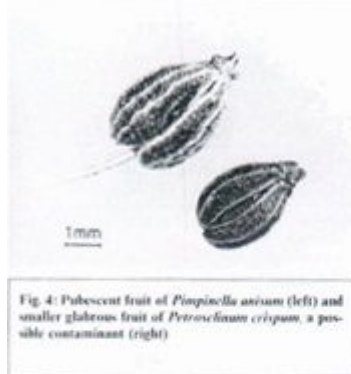


Fig. 4: Pubescent fruit of *Pimpinella anisum* (left) and smaller glabrous fruit of *Petroselinum crispum*, a possible contaminant (right)



Fig. 5: 1- to 2-celled, thick-walled, curved trichomes with warty cuticle from *Pimpinella anisum*

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

**6.1 Uses**

For promoting the dissolution of phlegm in catarrh of the respiratory tract; flatulence and colicky symptoms in the gastrointestinal tract, especially in nursing babies and infants.

**6.2 Contraindications**

Allergy to aniseed and anethole.

**6.3 Side effects**

Occasional allergic reactions by the skin, respiratory tract, and the gastrointestinal tract.

**6.4 Dosage and Mode of administration**

Boiling water (150ml) is poured over 1-2 teaspoonsful of crushed **Aniseed** and after 10-15min, passed through a tea strainer.

Unless otherwise prescribed, to promote the dissolution of phlegm, a cup of the freshly prepared tea is taken in the morning and/or at night before going to bed. For gastrointestinal complaints, a tablespoonful of the tea is taken several times a day. Nursing babies and infants may be given a teaspoonful, if used be in their bottle.

**6.5 Note**

Store protected from light and moisture.

**Adulteration:** See [1]. Occasionally (in former times more often, nowadays very rarely), the highly toxic coniine-containing fruit of *Conium maculatum* L., hemlock, are encountered in individual lots of aniseed [9]. Morphologically, hemlock fruit can be recognized by the undulate (especially in the upper part of the fruit) ridges. On moistening the powdered fruit with potassium hydroxide solution, they should not smell like mouse urine (coniine). Adulteration with parsley fruit is readily detected because of their small size and lack of pubescence (Fig. 4).

Currently, almost all lots of aniseed are contaminated with up to 1% coriander fruit. About pharmacopoeial anise oil, see: *Anisi stellati fructus*. Nowadays, commercial anise oils consist either of star-anise oil or (frequently) of natural, or technical grade, *trans*-anethole.

Adulteration of powdered aniseed or anise oil can be rapidly and reliably determined by direct mass spectroscopy via the "marker" compound pseudoisoeugenyl 2-methylbutyrate which only occurs in genuine "anise oil"; as little as 0.2-1.4% can be detected in the presence of 94% anethole, without the necessity of its having to be separated or the sample specially prepared [11].

**Storage:** Protected from moisture and light in glass or tin, but not plastic, containers (essential oil!).

**Literature:**

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