

Column temperature: A constant temperature of about 120°C.

Carrier gas: Nitrogen.

Flow rate: Adjust the flow rate so that the retention time of cineol is about 11 minutes.

Selection of column: Dissolve 0.1 g each of cineol and limonene in 25 mL of hexane. To 1 mL of this solution add hexane to make 20 mL. Proceed with about 2  $\mu$ L of this solution under the above operating conditions, and calculate the resolution. Use a column giving elution of limonene and cineol in this order with the resolution between these peaks being not less than 1.5.

**Containers and storage** Containers—Tight containers.

Storage—Light-resistant.

## Evodia Fruit

### *Evodiae Fructus*

ゴシユユ

Evodia Fruit is the fruit of *Evodia rutaecarpa* Bentham or *Evodia officinalis* Dode (*Rutaceae*).

**Description** Flattened spheroidal or globular fruit, 2–5 mm in diameter; externally dark brown to grayish brown, with many oil sacs appearing as hollow pits, and often with peduncle, 2–5 mm in length, covered densely with hairs; matured pericarp split to reveal five loculi, and each loculus containing obovoid or globular seeds of a lustrous brown to blackish brown or bluish black color. Odor, characteristic; taste, acrid, followed by a lasting bitterness.

**Identification** To 1.0 g of pulverized Evodia Fruit add 20 mL of methanol, heat for 5 minutes on a water bath, cool, and filter. Evaporate the filtrate to dryness, add 3 mL of dilute acetic acid to the residue, warm for 2 minutes on a water bath, cool, and filter. Perform the following tests using the filtrate as the sample solution.

(1) Spot one drop of the sample solution on a filter paper, air-dry, spray Dragendorff's TS for spraying, and allow to stand: a yellow-red color develops.

(2) To 0.2 mL of the sample solution add 0.8 mL of dilute acetic acid. To this solution add gently 2 mL of 4-dimethylaminobenzaldehyde TS, and warm in a water bath: a purple-brown ring develops at the zone of contact.

**Purity** (1) Peduncle—The amount of peduncles contained in Evodia Fruit does not exceed 5.0%.

(2) Foreign matter—The amount of foreign matter other than peduncles contained in Evodia Fruit does not exceed 1.0%.

**Total ash** Not more than 8.0%.

## Fennel

### *Foeniculi Fructus*

ウイキョウ

Fennel is the fruit of *Foeniculum vulgare* Miller (*Umbelliferae*).

**Description** Cylindrical cremocarp, 3.5–8 mm in length, 1–2.5 mm in width; externally grayish yellow-green to grayish yellow; two mericarps closely attached with each other, and with five longitudinal ridges; cremocarp often with pedicel 2–10 mm in length. Characteristic odor and taste.

Under a microscope, ridges near the bentral side are far protruded than those on the dorsal side; one large oil canal between each ridge, and two oil canals on the bentral side.

**Identification** To 0.5 g of pulverized Fennel add 10 mL of hexane, allow to stand for 5 minutes with occasional shaking, filter, and use the filtrate as the sample solution. Perform the test with this solution as directed under the Thin-layer Chromatography. Spot 5  $\mu$ L of the sample solution on a plate of silica gel with fluorescent indicator for thin-layer chromatography. Develop the plate with a mixture of hexane and ethyl acetate (20:1) to a distance of about 10 cm, and air-dry the plate. Examine under ultraviolet light (main wavelength: 254 nm): a main spot with a dark purple color appears at the *R<sub>f</sub>* value of about 0.4.

**Purity** (1) Peduncle—The amount of peduncles contained in Fennel does not exceed 3.0%.

(2) Foreign matter—The amount of foreign matter other than the peduncle contained in Fennel does not exceed 1.0%.

**Total ash** Not more than 10.0%.

**Acid-insoluble ash** Not more than 1.5%.

**Essential oil content** Perform the test with 50.0 g of pulverized Fennel as directed in the Essential oil content under Crude Drugs: the volume of essential oil is not less than 0.7 mL.

## Powdered Fennel

### *Foeniculi Fructus Pulveratus*

ウイキョウ末

Powdered Fennel is the powder of Fennel.

**Description** Powdered Fennel occurs as a greenish pale brown to greenish brown, and is a characteristic odor and taste.

Under a microscope, fennel powder reveals fragments of parenchyma cells of perisperm containing aleurone grain, fragments of parenchyma cells of endosperm containing fatty oil, fragments of sclerenchyma with characteristic single pits, fragments of oil canal within yellowish brown material, fragments of endocarp shown scalariform, spiral vessels, epidermis, stomata.