

changes to reddish brown, and the upper layer acquires a somewhat red color. Shake gently to mix the two layers together, and allow to stand: a persistent reddish brown color is produced.

## Bearberry Leaf

### *Uvae Ursi Folium*

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Bearberry Leaf is the leaf of *Arctostaphylos uva-ursi* (Linné) Sprengel (*Ericaceae*).

It contains not less than 7.0% of arbutin.

**Description** Obovate to spatulate leaves, 1–3 cm in length, 0.5–1.5 cm in width; upper surface yellow-green to dark green; lower surface light yellow-green; margin entire; apex obtuse or round, sometimes retuse; base cuneate; petiole very short; lamina thick with characteristic reticular vein, and easily broken. Odor, slight; taste, slightly bitter and astringent.

Under a microscope, the transverse section reveals thick cuticula; parenchyma cells of palisade tissue and sponge tissue being similar in form; in the vascular bundle, medullary ray consisting of 2 to 7 rows of one-cell line, appearing as bones of Japanese fan; polygonal solitary crystals and clustered crystals of calcium oxalate present sparsely in cells on both outer and inner sides of the vascular bundle, but no crystals in mesophyll.

**Identification** (1) Macerate 0.5 g of pulverized Bearberry Leaf with 10 mL of boiling water, shake the mixture for a few minutes, allow to cool, and filter. Place 1 drop of the filtrate on filter paper, and add 1 drop of iron (III) chloride TS: a dark purple color appears.

(2) To 0.2 g of pulverized Bearberry Leaf add 10 mL of a mixture of ethanol (95) and water (7:3), shake for 5 minutes, filter, and use the filtrate as the sample solution. Separately, dissolve 1 mg of arbutin for thin-layer chromatography in 1 mL of a mixture of ethanol (95) and water (7:3), and use this solution as the standard solution. Perform the test with the sample solution and the standard solution as directed under the Thin-layer Chromatography. Spot 10  $\mu$ L each of these solutions on a plate of silica gel for thin-layer chromatography. Develop the plate with a mixture of ethyl formate, formic acid and water (8:1:1) to a distance of about 15 cm, and air-dry the plate. Spray evenly diluted sulfuric acid (1 in 2) upon the plate, and heat at 105°C for 10 minutes: one spot among several spots from the sample solution and that from the standard solution show a yellow-brown to blackish brown color and the same *R<sub>f</sub>* value.

**Purity** (1) Twig—The amount of twigs contained in Bearberry Leaf does not exceed 4.5%.

(2) Foreign matter—The amount of foreign matter other than twigs contained in Bearberry Leaf does not exceed 2.0%.

**Total ash** Not more than 4.0%.

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

**Component determination** Weigh accurately about 0.5 g of pulverized Bearberry Leaf in a glass-stoppered centrifuge

tube, add 40 mL of water, shake for 30 minutes, centrifuge, and separate the supernatant liquid. To the residue add 40 mL of water, and proceed in the same manner. To the combined extracts add water to make exactly 100 mL, and use this solution as the sample solution. Separately, weigh accurately about 0.04 g of arbutin for component determination, previously dried for 12 hours (in vacuum, silica gel), dissolve in water to make exactly 100 mL, and use this solution as the standard solution. Perform the test with exactly 10  $\mu$ L each of the sample solution and the standard solution as directed under the Liquid Chromatography according to the following conditions. Determine the peak areas,  $A_T$  and  $A_S$ , of arbutin in each solution.

$$\begin{aligned} & \text{Amount (mg) of arbutin} \\ & = \text{amount (mg) of arbutin} \\ & \quad \text{for component determination} \\ & \quad \times \frac{A_T}{A_S} \end{aligned}$$

**Operating conditions**—

**Detector:** An ultraviolet spectrophotometer (wavelength: 280 nm).

**Column:** A stainless steel column 4–6 mm in inside diameter and 15–25 cm in length, packed with octadecylsilanized silica gel (5–10  $\mu$ m in particle diameter).

**Column temperature:** A constant temperature of about 20°C.

**Mobile phase:** A mixture of water, methanol and 0.1 mol/L hydrochloric acid TS (94:5:1).

**Flow rate:** Adjust the flow rate so that the retention time of arbutin is about 6 minutes.

**Selection of column:** Dissolve 0.05 g each of arbutin for component determination, hydroquinone and gallic acid in water to make 100 mL. Proceed with 10  $\mu$ L of this solution under the above operating conditions, and calculate the resolution. Use a column giving elution of arbutin, hydroquinone and gallic acid in this order, and clearly dividing each peak.

**System repeatability:** Repeat the test five times with the standard solution under the above operating conditions: the relative standard deviation of the peak area of arbutin is not more than 1.5%.

## Beef Tallow

### *Sevum Bovinum*

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Beef Tallow is a purified fat obtained by wet steam rendering from the fresh fatty tissues of *Bos taurus* Linné var. *domesticus* Gmelin (*Bovidae*).

**Description** Beef Tallow occurs as a white, uniform mass. It has a characteristic odor and a mild taste.

It is freely soluble in diethyl ether and in petroleum ether, very slightly soluble in ethanol (95), and practically insoluble in water.

It is breakable at a low temperature, but softens above 30°C.

Melting point: 42–50°C (Method 2)