

**MEADOWSWEET  
FOR HOMOEOPATHIC PREPARATIONS**

**SPIRAEA ULMARIA  
FOR HOMOEOPATHIC PREPARATIONS**

**Filipendula ulmaria ad praeparationes homoeopathicas**

DEFINITION

Fresh, blooming flower heads of *Filipendula ulmaria* (L.) Maxim (= *Spiraea ulmaria* L.).

CHARACTERS

Characteristic aromatic odour when crushed (methyl salicylate).

IDENTIFICATION

- A. Greenish-brown stem, stiff, angular, striated by straight, regular and longitudinal furrows; hollow stem except towards the apex, opening out at each node. Nodes arranged in a helix and a leaf comes out from each node. Compound leaf, imparipinnate, stalked, with a base often hidden by 2 reddish-brown, angular stipules; leaf bearing 3-9 pairs of leaflets, some of them are reduced to small strips spread out in a fan-like manner; terminal leaflet, the biggest one, divided into 3 parts; all these leaflets are irregularly dentate with teeth often of reddish-brown colour; leaflets dark green and glabrous on the upper side, tomentose, paler and sometimes silver on the underside; prominent and brown veins on the underside. Complex inflorescences borne on the upper part of the stem, composed of racemes of irregular corymbs; whitish, odorous flowers, composed of a 5-piece-calyx; corolla with 5 yellowish-white petals; androecium composed of numerous stamens; free multi-ovary carpels, more or less spiral-shaped.
- B. Examine with a magnifier (x 10). Flower showing 5 sepals fused at the base, dark green, villous, with tapered end and shaping a concave receptacle; corolla composed of 5 petals with a narrow base opening out quickly in a pale yellow, concave strip; stamens of the same colour, numerous (20-40), of unequal size, clearly (exert) longer than the corolla, shaping a bunch outside its margin; ovary composed of 4-5 carpels displayed in helix, topped by a short style ending with a globular stigma. Fruit presenting a helicoidal twist and containing some brownish seeds.

TESTS

**Foreign matter** (2.8.2): maximum 5 per cent, with no more than 1 per cent of stems with a diameter bigger than 5 mm.

**Loss on drying** (2.2.32): minimum 50.0 per cent, determined on 5.0 g of finely-cut drug, by drying in an oven at 105 °C for 2 h.

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*The General Chapters and General Monographs of the European Pharmacopoeia and Preamble of the French Pharmacopoeia apply.*

## STOCK

### DEFINITION

Meadowsweet mother tincture is prepared with ethanol (65 per cent *V/V*), using the fresh, blooming flower heads of *Filipendula ulmaria* (L.) Maxim (= *Spiraea ulmaria* L.).

Content: minimum 0.20 per cent *m/m* of total flavonoids, expressed as spiraeoside ( $C_{21}H_{20}O_{12}$ ;  $M_r$  464.4).

### PRODUCTION

*Method 4c (2371)*. Drug fragmented into segments, about 1 cm long. Maceration time: 3-5 weeks.

### CHARACTERS

Dark brown liquid.

### IDENTIFICATION

Thin-layer chromatography (2.2.27).

*Test solution*. Mother tincture.

*Reference solution*. Dissolve 10 mg of *salicylic acid R*, and 10 mg of *ferulic acid R* in 10 mL of *ethanol (96 per cent) R*.

*Plate*: TLC silica gel plate R (5-40  $\mu$ m) [or TLC silica gel plate R (2-10  $\mu$ m)].

*Mobile phase*: ether R, glacial acetic acid R, heptane R (9:10:81 *V/V/V*).

*Application*: 20  $\mu$ L [or 10  $\mu$ L] as bands.

*Development*: twice over a path of 10 cm [or 7 cm], renewing the mobile phase between each development.

*Drying*: in air.

*Detection A*: examine in ultraviolet light at 365 nm.

*Results A*: see below the sequence of fluorescent zones present in the chromatograms obtained with the reference solution and the test solution. Furthermore other faint fluorescent zones may be present in the chromatogram obtained with the test solution.

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Top of the plate	
Salicylic acid: a blue zone	A blue zone
Ferulic acid: a blue zone	A blue zone A blue zone
<b>Reference solution</b>	<b>Test solution</b>

**Detection B:** spray with a 200 g/L *phosphomolybdic acid R* solution in *ethanol (96 per cent) R*. Heat at 100-105 °C for 10 min. Examine in daylight.

**Results B:** see below the sequence of zones present in the chromatograms obtained with the reference solution and the test solution. Furthermore other faint zones may be present in the chromatogram obtained with the test solution.

Top of the plate	
Salicylic acid: a pink zone	A greenish-blue zone A greenish-blue zone A greenish-blue zone A greenish-blue zone
Ferulic acid: a greenish-blue zone	A greenish-blue zone A pink zone
<b>Reference solution</b>	<b>Test solution</b>

## TESTS

**Ethanol content (2.9.10):** 60 per cent V/V to 70 per cent V/V.

**Dry residue (2.8.16):** minimum 1.5 per cent *m/m*.

## ASSAY

Ultraviolet and visible absorption spectrophotometry (2.2.25).

**Stock solution.** Evaporate 0.900 g of mother tincture to dryness, under reduced pressure. Dilute the residue with 25 mL of a mixture of 10 volumes of *methanol R* and 100 volumes of *glacial acetic acid R*.

**Test solution.** Place 2.0 mL of stock solution into a 25.0 mL volumetric flask, add 8 mL of a mixture of 10 volumes of *methanol R* and 100 volumes of *glacial acetic acid R* and 10 mL of a 25.0 g/L *boric acid R* and 20.0 g/L *oxalic acid R* solution in *anhydrous formic acid R*. Dilute to 25.0 mL with *glacial acetic acid R*.

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*Compensation liquid of the test solution.* Place 2.0 mL of stock solution into a 25.0 mL volumetric flask, add 8 mL of a mixture of 10 volumes of *methanol R* and 100 volumes of *glacial acetic acid R*. Then add 10.0 mL of *anhydrous formic acid R*. Dilute to 25.0 mL with *glacial acetic acid R*.

*Reference stock solution.* In a 100.0 mL volumetric flask, dissolve 20.0 mg of *spiraeoside R* in a mixture of 10 volumes of *methanol R* and 100 volumes of *glacial acetic acid R*. Dilute to 100.0 mL with the same mixture. In a 20.0 mL volumetric flask, place 5.0 mL of this solution and dilute to 20.0 mL with a mixture of 10 volumes of *methanol R* and 100 volumes of *glacial acetic acid R*.

*Reference solution.* Place 5.0 mL of reference stock solution into a 25.0 mL volumetric flask, add 5 mL of a mixture of 10 volumes of *methanol R* and 100 volumes of *glacial acetic acid R* then 10 mL of a 25.0 g/L *boric acid R* and 20.0 g/L *oxalic acid R* solution in *anhydrous formic acid R*. Dilute to 25.0 mL with *glacial acetic acid R*.

*Compensation liquid of the reference solution.* Place 5.0 mL of reference stock solution into a 25.0 mL volumetric flask, add 5 mL of a mixture of 10 volumes of *methanol R* and 100 volumes of *glacial acetic acid R* and 10 mL of *anhydrous formic acid R*. Dilute to 25.0 mL with *glacial acetic acid R*.

Thirty min after the addition of the last reagent, measure the absorbance of the test solution and the reference solution, at 430 nm, in comparison with the compensation liquids.

Calculate the percentage content *m/m* of total flavonoids, expressed as spiraeoside, from the expression:

$$\frac{A_1 \times m_2 \times 15.6}{A_2 \times m_1}$$

$A_1$  = absorbance of the test solution,

$A_2$  = absorbance of the reference solution,

$m_1$  = mass of the mother tincture sample, in grams,

$m_2$  = mass of spiraeoside sample, in grams.

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