

LIME TREE FOR HOMOEOPATHIC PREPARATIONS TILIA EUROPAEA FOR HOMOEOPATHIC PREPARATIONS

Tilia cordata ad praeparationes homoeopathicas

Other Latin names used in homoeopathy: **Tilia cordata**

Tilia sylvestris

DEFINITION

Fresh, inflorescence of *Tilia cordata* Mill.

IDENTIFICATION

- A. Cyme inflorescence of 2-7 flowers, occasionally amounting to 16; main axis of the inflorescence bearing a linguiform bract, membranous, light yellow, practically fused to the inflorescence peduncle up to about half its midrib. Fragrant, yellowish-white flowers. Sepals up to 6 mm long, easily detached from the perianth with abaxial surface usually glabrous and adaxial surface and borders strongly pubescent. Five, thin, spatulate petals yellowish-white up to 8 mm long with a thin venation; only their borders sometimes show isolated covering trichomes. Numerous free stamens forming 5 groups. Superior ovary bearing a style with a stigma divided into 5 hardly distinct lobes.
- B. Take a sample of abaxial epidermis from the bract. Examine under a microscope using *chloral hydrate solution R*, epidermis composed of cells with wavy-sinuous anticlinal cell-walls, scarce uni or bicellular covering trichomes and stomata of anomocytic type (2.8.3).

TESTS

Foreign matter (2.8.2): maximum 5 per cent.

Loss on drying (2.2.32): minimum 60.0 per cent, determined on 5.0 g of finely-cut drug, by drying in an oven at 100-105 °C for 2 h.

Tilia platyphyllos. The presence of inflorescences composed of 2-5 flowers shows adulteration by *Tilia platyphyllos* Scop.

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

2008.

Tilia tomentosa. The presence of inflorescences whose flowers bear a petal and strip-shaped staminode shows adulteration by *Tilia tomentosa* Moench.

STOCK

DEFINITION

Lime-tree mother tincture is prepared with ethanol (55 per cent *V/V*), using fresh, inflorescence of *Tilia cordata* Mill.

Content : minimum 0.050 per cent *m/m* of total flavonoids, expressed as isoquercitrin ($C_{21}H_{20}O_{12}$; M_r 464.4).

PRODUCTION

Method 4c (2371). Whole drug. Maceration time : 3 to 5 weeks.

CHARACTERS

Orange-brown liquid.

IDENTIFICATION

Thin layer chromatography (2.2.27).

Test solution. Mother tincture.

Reference solution. Dissolve 10 mg of *hyperoside R*, 10 mg of *quercitrin R* and 10 mg of *rutin R* in 20 ml of *methanol R*.

Plate : TLC silica gel plate *R*.

Mobile phase : *anhydrous formic acid R*, *water R*, *ethyl acetate R* (10:10:80 *V/V/V*).

Application : 20 μ l, as bands.

Development : over a path of 10 cm.

Drying : in air.

Detection : first spray with a 10 g/l solution of *diphenylboric acid aminoethyl ester R* in *methanol R* then with a 50 g/l solution of *macrogol 400 R* in *methanol R*. Allow the plate to dry for about 30 min. Examine in ultraviolet light at 365 nm.

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Results : 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.

Top of the plate	
Quercitrin : an orange zone -----	A green zone A green zone An orange zone (quercitrin) A green zone -----
Hyperoside : an orange zone -----	An orange zone An orange zone An orange zone -----
Rutin : an orange zone	
Reference solution	Test solution

TESTS

Ethanol content (2.9.10) : 50 per cent *V/V* to 60 per cent *V/V*.

Dry residue (2.8.16) : minimum 1.2 per cent *m/m*.

ASSAY

Ultraviolet and visible absorption spectrophotometry (2.2.25).

Stock solution. Evaporate 3.000 g of mother tincture to dryness under reduced pressure. Dilute the residue in 25.0 ml of a mixture of 10 volumes of *methanol R* and 100 volumes of *glacial formic acid R*.

Test solution. In a 25.0 ml volumetric flask, place 5.0 ml of stock solution, add 5 ml of a mixture of 10 volumes of *methanol R* and 100 volumes of *glacial acetic acid R* and 10.0 ml of a 25.0 g/l solution of *boric acid R* and a 20.0 g/l solution of *oxalic acid R* in *anhydrous formic acid R* then dilute to 25.0 ml with *glacial acetic acid R*.

Compensation liquid. In a 25.0 ml volumetric flask, place 5.0 ml of stock solution, add 5 ml of a mixture of 10 volumes of *methanol R* and 100 volumes of *glacial acetic acid R* and 10.0 ml of *anhydrous formic acid R* then dilute to 25.0 ml with *glacial acetic acid R*.

Reference stock solution. In a 100.0 ml volumetric flask, dissolve 12.0 mg of *isoquercitrin R* in a mixture of 10 volumes of *methanol R* and 100 volumes of *glacial acetic acid R* and dilute to 100.0 ml with the same mixture.

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Reference solution. In a 25.0 ml volumetric flask, place 2.0 ml of reference stock solution, add 8 ml of a mixture of 10 volumes of *methanol R* and 100 volumes of *glacial acetic acid R* and 10.0 ml of a 25.0 g/l solution of *boric acid R* and a 20.0 g/l solution of *oxalic acid R* in *anhydrous formic acid R* then dilute to 25.0 ml with *glacial acetic acid R*.

Compensation liquid of the reference solution. In a 25.0 ml volumetric flask, place 2.0 ml of reference stock solution, add 8 ml of a mixture of 10 volumes of *methanol R* and 100 volumes of *glacial acetic acid R* and 10.0 ml of *anhydrous formic acid R* then dilute to 25.0 ml with *glacial acetic acid R*.

After 30 min, measure the absorbance of the test solution and the reference solution at 425 nm in comparison with the compensation liquids.

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

$$\frac{A_1 \times m_2 \times 10}{A_2 \times m_1}$$

A_1 = absorbance of the test solution,

A_2 = absorbance of the reference solution,

m_1 = mass of the mother tincture sample in the stock solution, in grams,

m_2 = mass of isoquercitrin sample in the reference stock solution, in grams.