FRINGE TREE
FOR HOMOEOPATHIC PREPARATIONS

CHIONANTHUS VIRGINIANA
FOR HOMOEOPATHIC PREPARATIONS

Chionanthus virginica ad praeparationes homoeopathicas

Other Latin name used in homoeopathy: **Chionanthus**

DEFINITION

Dried root bark, entire or fragmented, of *Chionanthus virginica* L.

Content: minimum 2.0 per cent of total dihydroxycinnamic derivatives, expressed as rosmarinic acid ($C_{18}H_{16}O_8$; M_r 360) (dried drug).

IDENTIFICATION

A. The root bark of fringe tree possesses raised, circular lenticels. The outside is grey-brown to red-brown in colour. The bark fragments are curved or flattened, dense and 2-6 mm wide. The more or less scaly and rough outside surface shows transverse wrinkles and small root scars. The inside surface is yellow-orange with irregular striations and sometimes circular depressions. The fracture is short, hard, and roughly granular. The broken surface is yellow-white to light brown.

B. Microscopic examination *(2.8.23)*. Reduce the bark of the root to a powder (355). Examine under a microscope using *chloral hydrate solution R*. The powder contains fragments of phellem consisting of stacked polyhedral cells, cortical parenchyma with ovoid cells containing starch grains, numerous sclereid cells, isolated or in clusters, with extremely thick, grooved walls.

C. Thin-layer chromatography (*2.2.27*).

Test solution. To 3 g of powdered (355) herbal drug, add 30 mL of *ethanol* (65 per cent *V/V*) *R*. Heat under a reflux condenser for 15 min. Allow to cool. Filter.

Reference solution. Dissolve 5 mg of *aescin R* and 5 mg of α-*hederin R* in 10 mL of *methanol R*.

Plate: *TLC silica gel plate R (5-40 µm) [*or *TLC silica gel plate R (2 -10 µm)*].

Mobile phase: *water R, methanol R, glacial acetic acid R, methylene chloride R* (2:3:8:15 *V/V/V/V*).

Application: 20 µL [or 10 µL], as bands.

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

Development: over a path of 10 cm [or 7 cm].

Drying: in air.

Detection: spray with a 100 g/L solution of *sulfuric acid R* in *ethanol (96 per cent V/V) R*. Heat to 100-105 °C for 5 min. Examine in daylight.

Results: 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	
α-Hederin: a purple-brown zone	A purple-brown zone A purple-brown zone
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Aescin: a brown zone	Series of brown zones
-----	-----
	Series of brown zones
Reference solution	**Test solution**

TESTS

Loss on drying (*2.2.32*): maximum 12.0 per cent, determined on 1.000 g of powdered (355) herbal drug, by drying in an oven at 105 °C for 2 h.

Total ash (*2.4.16*): maximum 8.0 per cent.

ASSAY

Ultraviolet and visible absorption spectrophotometry (*2.2.25*).

Mother solution. In a flask, place 0.400 g of powdered herbal drug (355). Add 80 mL of a mixture composed of 35 volumes of *water R* and 65 volumes of *ethanol R*. Boil under reflux for 30 min. Allow to cool. Filter and collect the filtrate. Rinse the flask and the filter with 10 mL of a mixture composed of 35 volumes of *water R* and 65 volumes of *ethanol (96 per cent) R* and 2 quantities, each of 5 mL of the same mixture and dilute to 100.0 mL with the same mixture.

Test solution. Add successively, shaking after each addition, 2.0 mL of mother solution, 2.0 mL of *0.5 M hydrochloric acid,* 2.0 mL of a solution containing 100 g/L of *sodium nitrite R* and 100 g/L of *sodium molybdate R* , 2.0 mL of *1 M sodium hydroxide* and dilute to 20.0 mL with *water R*.

Compensation liquid of test solution. Dilute 2.0 mL mother solution, 2.0 mL of *0.5 M hydrochloric acid*, 2.0 mL of *1 M sodium hydroxide* to 20.0 mL with *water R*.

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

Reference mother solution. Dissolve 10.0 mg of r*osmarinic acid R* in a few millilitres of a mixture of 35 volumes of *water R* and 65 volumes of *ethanol (96 per cent) R* and dilute to 100.0 mL with the same mixture.
Reference solution. Add successively, shaking after each addition, 2.0 mL of reference mother solution, 2.0 mL of *0.5 M hydrochloric acid*, 2.0 mL of a solution containing 100 g/L of *sodium nitrite R* and 100 g/L of *sodium molybdate R* , 2.0 mL of *1 M sodium hydroxide R* and dilute to 20.0 mL with *water R*.

Compensation liquid of reference solution. Dilute 2.0 mL mother reference solution, 2.0 mL of *0.5 M hydrochloric acid*, and 2.0 mL of *1 M sodium hydroxide* to 20.0 mL with *water R*.

Measure the absorbance of the test solution and the reference solution immediately after adding the last reagent at 505 nm, in comparison with compensation liquids.

Calculate the percentage content of total hydroxycinnamic derivatives, expressed as rosmarinic acid, from the expression:

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

A_1 = absorbance of the test solution,
A_2 = absorbance of the reference solution,
m_1 = mass of the drug sample, in grams,
m_2 = mass of *rosmarinic acid R* in reference mother solution, in grams,
p = content per cent in rosmarinic acid in *rosmarinic acid R.*

STOCK

DEFINITION

Fringe tree mother tincture is prepared with *ethanol* (65 per cent *V/V*), using the dried root bark, entire or fragmented, of *Chionanthus virginica* L.

Content: minimum 0.14 per cent *m/m* of total dihydroxycinnamic derivatives, expressed as rosmarinic acid ($C_{18}H_{16}O_8$; M_r 360).

PRODUCTION

Method 1.1.10 (2371). Drug fragmented into segments 1-3 cm long. Maceration time: 3-5 weeks.

CHARACTERS

Appearance: orange-brown liquid.

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

IDENTIFICATION

Thin-layer chromatography (*2.2.27).*

Test solution. Mother tincture.

Reference solution. Dissolve 5 mg of *aescin R* and 5 mg of α-*hederin R* in 10 mL of *methanol R*.

Plate: *TLC silica gel plate R (5-40 µm) [or TLC silica gel plate R (2-10 µm)*].

Mobile phase: *water R, methanol R, glacial acetic acid R, methylene chloride R* (2:3:8:15 *V/V/V/V*).

Application: 20 µL [or 10 µL], as bands.

Development: over a path of 10 cm [or 7 cm].

Drying: in air.

Detection: spray with a 100 g/L solution of *sulfuric acid R* in *ethanol* (*96 per cent V/V) R*. Heat to 100-105 °C for 5 min. Examine in daylight.

Results: 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	
α-Hederin: a purple-brown zone	A purple-brown zone
	A purple-brown zone
-----	-----
Aescin : a brown zone	
	Series of brown zones
-----	-----
	Series of brown zones
Reference solution	**Test solution**

TESTS

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

Dry residue (*2.8.16*): minimum 2.0 per cent *m/m*.

ASSAY

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

Ultraviolet and visible absorption spectrophotometry (*2.2.25*).

Mother solution. To 6.000 g of mother tincture, add a mixture of 35 volumes of *water R* and 65 volumes of *ethanol (96 per cent) R* complete with 100.0 mL of the same mixture.

Test solution. Add successively, shaking after each addition, 2.0 mL of mother solution, 2.0 mL of *0.5 M hydrochloric acid*, 2.0 mL of a solution containing 100 g/L of *sodium nitrite R* and 100 g/L of *sodium molybdate R* , 2.0 mL of *1 M sodium hydroxide* and dilute to 20.0 mL with *water R*.

Compensation liquid of test solution. Dilute 2.0 mL of mother solution, 2.0 mL of *0.5 M hydrochloric acid*, 2.0 mL of *1 M sodium hydroxide* to 20.0 mL with *water R*.

Reference mother solution. Dissolve 10.0 mg of *rosmarinic acid R* in a few millilitres of a mixture of 35 volumes of *water R* and 65 volumes of *ethanol (96 per cent) R* and dilute to 100.0 mL with the same mixture of solvents.

Reference solution. Add successively, shaking after each addition, 2.0 mL of reference mother solution, 2.0 mL of *0.5 M hydrochloric acid*, 2.0 mL of a solution containing 100 g/L of *sodium nitrite R* and 100 g/L of *sodium molybdate R*, 2.0 mL of *1 M sodium hydroxide R* and dilute to 20.0 mL with *water R*.

Compensation liquid of reference solution. Dilute 2.0 mL of reference mother solution, 2.0 mL of *0.5 M hydrochloric acid* and 2.0 mL of *1 M sodium hydroxide* to 20.0 mL with *water R*.

Measure the absorbance of the test solution and the reference solution immediately after adding the last reagent at 505 nm, in comparison with compensation liquids.

Calculate the percentage content of total hydroxycinnamic derivatives, expressed as rosmarinic acid from the expression:

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

A_1 = absorbance of the test solution,
A_2 = absorbance of the reference solution,
m_1 = mass of the mother tincture, in grams,
m_2 = mass of *rosmarinic acid R* in reference mother solution, in grams,
p = content per cent in rosmarinic acid in *rosmarinic acid R.*

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