COMMON FIGWORT FOR HOMOEOPATHIC PREPARATIONS

SCROFULOSA NODOSA FOR HOMOEOPATHIC PREPARATIONS

Scrophularia nodosa ad praeparationes homoeopathicas

DEFINITION

Whole, fresh, flowering plant, *Scrophularia nodosa* L.

CHARACTERS

Macroscopic and microscopic characters described under identification tests A and B.

IDENTIFICATION

A. Herbaceous plant, glabrous, perennial thanks to a thick bulging rhizome, knotty, short and compact, sprouting numerous adventive roots. Erect stem, stiff, quadrangular, measuring up to 150 cm high, brownish-red with a full section. Stalked, opposite leaves, dark green, triangular, cordiform at the base, pointed at the apex, with irregularly toothed margins. Flowers with a long peduncle, in terminal, glandular panicle. Calyx with 5 somewhat equal divisions, rimmed with a narrow membranous margin. Corolla 6-10 cm long, clearly zygomorphic, with a large bellied tube with 2 lips; to brown upper lip, bilobed with a small inside scale and greenish and trilobed lower lip. Four didydanous stamens. Ovary producing an ovoid capsule with an apicule, on maturity.

B. Examine a fragment of abaxial epidermis of a leaf, under a microscope using *chloral hydrate solution R*: lamina epidermis covered with a cuticle finely striated, composed of cells with walls lobed as a puzzle and anomocytic stomata (*2.8.3*), surrounded by 3-5 cells; epidermis of the ribs with striated cuticle composed of elongated cells, rectangular to parallelipipedic and glandular trichomes with unicellular foot and bi to tetra cellular head.

TESTS

Foreign matter (*2.8.2*): maximum 5 per cent.

Loss on drying (*2.2.32*): minimum 65.0 per cent, determined on 5.0 g of finely-cut drug, by drying in an oven at 105 °C for 2 h.

Scrophularia aquatica. The presence of a hollow stem and leaves with winged petioles shows adulteration by *Scrophularia aquatica* L.

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

STOCK

DEFINITION

Common figwort mother tincture complies with the requirements of the general technique for the preparation of mother tinctures (see *Homoeopathic Preparations (1038)* and French Pharmacopoeia Supplement). The mother tincture is prepared with ethanol (65 per cent *V/V*), using the whole, fresh, flowering plant, *Scrophularia nodosa* L.

Content: minimum 0.03 per cent *m/m* of harpagoside ($C_{24}H_{30}O_{11}$; M_r 494.5).

CHARACTERS

Appareance: brown liquid.

IDENTIFICATION

Thin-layer chromatography (*2.2.27*).

Test solution. Mother tincture.

Reference solution. Dissolve 10 mg of *harpagoside R* and 10 mg of *aucubin R* in 10 mL of *methanol R*.

Plate: *TLC silica gel plate R*.

Mobile phase: *ethanol* (*96 per cent*) *R, methylene chloride R* (10:20 *V/V*).

Application: 20 µL as bands.

Development: over a path of 10 cm.

Drying: in air.

Detection: spray with *anisaldehyde solution R.* Heat the plate at 100-105 °C for 10 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.

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

Top of the plate	
	Two to three purple to brown zones
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Harpagoside: a purple zone	A purple zone (harpagoside) Two greenish-brown zones
Aucubin: a purplish-brown zone	
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	Two purple to 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 1.8 per cent *m/m*.

ASSAY

Liquid chromatography (*2.2.29*).

Internal standard solution. In a 100.0 mL volumetric flask, dissolve 0.130 g of *methyl cinnamate R* in 50 mL of *methanol R* and dilute to 100.0 mL with the same solvent.

Test solution. Place 5.000 g of mother tincture into a 25.0 mL volumetric flask and dilute to 25.0 mL with *methanol R*. Place 10.0 mL of this solution into a 25.0 mL volumetric flask, add 1.0 mL of internal standard solution and dilute to 25.0 mL with *methanol R*.

Reference solution. In a 10.0 mL volumetric flask, dissolve 0.004 g of *harpagoside R* in *methanol R* and dilute to 10.0 mL with the same solvent.

Column:
- *size*: *l* = 0.125 m, Ø = 4 mm,
- *stationary phase*: *octadecylsilyl silica gel for chromatography R* (5 µm).

Mobile phase: *methanol R, water R* (50:50 *V/V*).

Flow rate: 1.5 mL/min.

Detection: spectrophotometer at 278 nm.

Injection: 10 µL.

Inject the test solution. Adjust the sensitivity of the system so that the peak due to methyl cinnamate represent 50 per cent of the height of the recorder

Determine the retention time of harpagoside using 10 µL of reference solution, examined under the same conditions as the test solution.

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

Calculate the percentage content *m/m* of harpagoside, from the expression:

$$\frac{A_1 \times m_2 \times 7.622}{A_2 \times m_1}$$

A_1 = area of the peak due to harpagoside in the chromatogram obtained with the test solution,
A_2 = area of the peak due to methyl cinnamate in the chromatogram obtained with the test solution,
m_1 = mass of the mother tincture sample, in grams,
m_2 = mass of methyl cinnamate in the internal standard solution, in grams.

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