BOGBEAN
FOR HOMOEOPATHIC PREPARATIONS

MENYANTHES TRIFOLIATA
FOR HOMOEOPATHIC PREPARATIONS

Menyanthes trifoliata ad praeparationes homoeopathicas

DEFINITION

Whole, fresh, blooming plant, *Menyanthes trifoliata* L.

CHARACTERS

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

IDENTIFICATION

A. Glabrous, perennial, aquatic, herbaceous plant, fixed in the mud with adventive roots, bearing at its top fairly long petioled leaves rising above the surface of the water. Glaucous green, compound leaves with 3 large, oval obtuse leaflets, 5 cm to 10 cm long with entire or crenate margin. Floriferous stalk, 40 cm high, rising from the axil of a rhizome scale. Pinkish-white raceme of flowers, of type 5. Green, oval sepals. Infudibuliform corolla with large, triangular, spread out lobes, filled with long, white, entangled hairs. Five stamens inserted in the tube of the corolla. Purplish-red anthers. Ovary with 2 carpels topped by a perennial, filiform style and a bifid stigma.

B. Take a sample of epidermis from the underside of a leaf. Examine under a microscope using *chloral hydrate solution R.* Lamina epidermis composed of cells with slightly sinuous cell-walls, stomata of anomocytic type with 3 to 5 subsidiary cells (*2.8.3*); nervation epidermis cells with stiff cell-walls, elongated along the rib.

TESTS

Foreign matter (*2.8.2*): complies with the test.

Loss on drying (*2.2.32*): minimum 70.0 per cent, determined on 5.0 g of finely-cut drug, by drying in an oven at 105 °C for 2 h.

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

STOCK

DEFINITION

Bogbean mother tincture complies with the requirements of the general technique for the preparation of mother tinctures (see *Homoeopathic Preparations (1038)* and French Pharmacopoeia Authority Supplement). The mother tincture is prepared with ethanol (45 per cent *V/V)*, using whole, fresh, blooming plant *Menyanthes trifoliata* L.

Content: minimum 0.10 per cent *m/m* of total iridoids, expressed as catalpol ($C_{15}H_{22}O_{10}$; M_r 362.3)

CHARACTERS

Appearance: dark brown liquid.

IDENTIFICATION

Thin layer chromatography (*2.2.27*).

Test solution. Mother tincture.

Reference solution. Dissolve 5 mg of *loganine R* and 5 mg of *catalpol R* in 15 mL of *methanol R*.

Plate: *TLC silica gel plate R*.

Mobile phase: *water R, methanol R, ethyl acetate R* (8:15:77 *V/V/V).*

Application: 30 µL, as bands.

Development: over a path of 15 cm.

Drying: in air.

Detection: spray with *vanillin reagent R.* Heat 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	
Loganine: a greyish-purple zone ------ Catalpol: a brown zone ------	A purple zone An intense blue zone ------ A grey to greyish-blue zone ------ A large brownish zone
Reference solution	**Test solution**

TESTS

Ethanol (*2.9.10*): 40 per cent *V/V* to 50 per cent *V/V.*

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

ASSAY

Ultraviolet and visible absorption spectrophotometry (*2.2.25*).

Test solution. In a 100.0 mL volumetric flask, place 5.000 g of mother tincture accurately weighed and dilute with m*ethanol R*. In a round-bottomed flask, place 1.0 mL of this solution and evaporate to dryness, under reduced pressure. Dissolve in 5.0 mL of a solution obtained with a mixture of 0.5 mL of a solution of *ferric chloride* (10 per cent *m/V*) *R* and 100 mL of *sulfuric acid* (50 per cent *V/V*) *R.* Heat on a water-bath at 80 °C for 3 min so the coloration can develop.

Reference solution. In a 10.0 mL volumetric flask, place 2.0 mg of *catalpol R* accurately weighed and dilute with *methanol R*. In a round-bottomed flask, place 1.0 mL of this solution and evaporate to dryness under reduced pressure. Dissolve in 5.0 mL of a solution obtained with a mixture of 0.5 mL of a solution of *ferric chloride* (10 per cent *m/V*) *R* and 100 mL of *sulfuric acid* (50 per cent *V/V*) *R.* Heat on a water-bath at 80 °C for 3 min so the coloration can develop.

Compensation liquid. In a round-bottomed flask, place 1.0 mL of *methanol R* and evaporate to dryness. Dissolve in 5.0 mL of a solution obtained with a mixture of 0.5 mL of a solution of *ferric chloride* (10 per cent *m/V*) *R* and 100 mL of *sulfuric acid* (50 per cent *V/V*) *R.* Heat on a water-bath at 80 °C for 3 min so the coloration can develop.

Measure the absorbance of the test solution and the reference solution at 411 nm in comparison with the compensation liquid.

Calculate the percentage content *m/m* of total iridoids, expressed as catalpol from the expression:

$$\frac{A_1}{A_2} \times \frac{m_2}{m_1} \times 1000$$

A_1 = absorbance of the test solution at 411 nm,
A_2 = absorbance of the reference solution at 411 nm,
m_1 = mass of the mother tincture sample in grams,
m_2 = mass of catalpol sample in grams.

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