

## COMMON BONESET FOR HOMOEOPATHIC PREPARATIONS

### EUPATORIUM PERFOLIATUM FOR HOMOEOPATHIC PREPARATIONS

#### *Eupatorium perfoliatum* ad praeparationes homoeopathicas

#### DEFINITION

Fresh, flowering aerial parts of *Eupatorium perfoliatum* L., harvested at the beginning of the blooming season.

#### CHARACTERS

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

The leaves exhale a fragrance of vanilla.

#### IDENTIFICATION

- A. Erect, striated, pubescent and ramose stem on the upper part, measuring up to 1.20 m long and seeming to cross the leaves. Leaves 10-20 cm long and 3-6 cm large, regularly displayed along the conical and decussate stem; lanceolate lamina with dentate margins and acute apex showing more abundant pubescence on the underside. Cylindrical capitula about 4 mm large and 7 mm long, gathered in groups of 8-10 ending in corymbs. Involucre composed of 12-15 interwoven bracts, thinly lanceolate. Bare receptacle where only white, tubular, regular and vase-shaped flowers are inserted.
- B. Examine a sample of underside epidermis of the leave under a microscope, using *chloral hydrate solution R*. Lamina epidermis composed of polyhedral cells. Numerous stomata. Covering or secretory trichomes. Uniseriate and multicellular, covering trichomes, some are stiff with slightly thickened cell-walls, the others are flexuous composed of a basis of 4-5 short cells and of a flagellate distal cell. Biseriate and sessile secretory trichomes of Asteraceae type.

#### TESTS

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

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

**Eupatorium cannabinum.** The presence of non-conical leaves, divided into 3 or 5 leaflets shows adulteration by *Eupatorium cannabinum* L. The absence of vanilla fragrance shows adulteration by *Eupatorium cannabinum* L.

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

## STOCK

### DEFINITION

Common boneset mother tincture complies with the requirements of the general technique for the preparation of mother tinctures (see *Homeopathic Preparations (1038)* and French Pharmacopoeia Supplement). The mother tincture is prepared with ethanol (65 per cent V/V), using the fresh, flowering aerial part of *Eupatorium perfoliatum* L.

*Content:* minimum 0.08 per cent *m/m* of total flavonoids, expressed as astragalín ( $C_{21}H_{20}O_{11}$ ;  $M_r$  448.4).

### CHARACTERS

*Appearance:* greenish-brown liquid.

### IDENTIFICATION

Examine the chromatograms obtained with the test of mother tincture of *Eupatorium cannabinum*.

*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 yellow zone A greenish-blue zone  -----
Chlorogenic acid: a greenish-blue zone -----	One to two orange zones  -----
<b>Reference solution</b>	<b>Test solution</b>

### TESTS

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

**Dry residue** (2.8.16): minimum 1.0 per cent *m/m*.

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**Mother tincture of *Eupatorium cannabinum*.**

Thin-layer chromatography (2.2.27).

*Test solution.* Mother tincture.

*Reference solution.* Dissolve 10 mg of *chlorogenic acid R* and 10 mg of *quercitrin R* in 20 mL of *methanol R*.

*Plate:* TLC silica gel plate *R*.

*Mobile phase:* anhydrous formic acid *R*, water *R*, methyl ethyl ketone *R*, ethyl acetate *R* (10:10:30:50 V/V/V/V).

*Application:* 20 µL 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.

*Results:* the absence of one to two orange zones shows adulteration by *Eupatorium cannabinum L*.

**ASSAY**

Ultraviolet and visible absorption spectrophotometry (2.2.25).

*Stock solution.* In a 100.0 mL volumetric flask, place 10.000 g of mother tincture. Dilute to 100.0 mL with *ethanol* (60 per cent V/V) *R*.

*Test solution.* In a 25.0 mL volumetric flask, place 2.0 mL of stock solution, 2.0 mL of a 20 g/L solution of *aluminium chloride R* in *methanol R* and dilute to 25.0 mL with *methanol R*.

*Compensation liquid.* In a 25.0 mL volumetric flask, place 2.0 mL of stock solution and dilute to 25.0 mL with *methanol R*.

Twenty-five min later, measure the absorbance of the test solution at 402 nm, in comparison with the compensation liquid.

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

$$\frac{A \times 1250}{282 \times m}$$

*i.e.* taking the specific absorbance of astragalin, to be 282 at 402 nm.

$A$  = absorbance of the test solution at 402 nm,  
 $m$  = mass of the mother tincture sample, in grams.

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