SOUTHERNWOOD FOR HOMOEOPATHIC PREPARATIONS

ABROTANUM FOR HOMOEOPATHIC PREPARATIONS

Artemisia abrotanum ad præparationes homœopathicas

DEFINITION

Fresh, non-woody aerial part of *Artemisia abrotanum* L.

CHARACTERS

Lemon like odour.

IDENTIFICATION

A. Green, erect, cylindrical, ramose stem. Petiolate leaves finely pubescent on the underside and glabrous on the upper side; lower leaves 2-3 pinnatipartite, upper leaves pinnatipartite and non auriculate.

B. Take a sample of epidermis from the underside of the leaf. Examine under a microscope, using *chloral hydrate solution R*: stomatiferous epidermis bearing covering and secretory trichomes; T-shaped covering trichomes with usually a 3-celled foot and a long distal cell; sessile secretory trichomes of Asteraceæ-type with a biseriate multicellular head.

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 105 °C for 2 h.

STOCK

DEFINITION

Southernwood mother tincture is prepared with ethanol (65 per cent *V/V*), using the fresh, non-woody aerial part of *Artemisia abrotanum* L.

Content: minimum 0.10 per cent *m/m* of total *ortho*-dihydroxycinnamic derivatives, expressed as chlorogenic acid ($C_{16}H_{18}O_9$; M_r 354.3).

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

PRODUCTION

Method 1.1.10 (2371). Drug fragmented into segments 0.5-3 cm long. Maceration time: 3-5 weeks.

CHARACTERS

Appearance: greenish-brown liquid.

IDENTIFICATION

Thin-layer chromatography (*2.2.27*).

Test solution. Mother tincture.

Reference solution. Dissolve 10 mg of *rutin R*, 10 mg of *chlorogenic acid R* and 1 mg of *scopoletin R* in 40 mL of *ethanol (96 per cent) 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 µL, as bands.

Development: over a path of 10 cm.

Drying: in air.

Detection A: examine in ultraviolet light at 365 nm.

Results A: 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	
	A red zone (solvent front)
Scopoletin: a blue zone	A blue zone (scopoletin)
	A brown zone
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Chlorogenic acid: a pale blue zone	A pale blue zone (chlorogenic acid)
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	A pale green zone
	A blue zone
Rutin: a brown zone	A brown zone (rutin)
Reference solution	**Test solution**

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Detection B: 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 B: 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	
	An orange zone
Scopoletin*:* a blue zone	A blue zone (scopoletin)
	Two green zones
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	A yellow zone
Chlorogenic acid: a yellowish-green zone	A yellowish-green zone (chlorogenic acid)
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Rutin: an orange zone	An orange zone (rutin)
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 1.5 per cent *m/m.*

Artemisia absinthium mother tincture. Distil 10 g of Southernwood mother tincture. To the distillate, add 2 mL of *zinc sulfate solution R* and 0.5 mL of 50 g/L *sodium nitroprusside solution R*. Shake, then add 4 mL of carbon dioxide-free *dilute sodium hydroxide solution R* and after a few minutes, 2-3 mL of *glacial acetic acid R*. No orange-red colour appears. The presence of an orange-red colour turning purple-brown may indicate adulteration by *Artemisia absinthium* L. mother tincture (absinthine).

ASSAY

Ultraviolet and visible absorption spectrophotometry (*2.2.25*).

Stock solution. Place 2.500 g of mother tincture in a 50.0 mL volumetric flask, and dilute to 50.0 mL with *ethanol* (*50 per cent V/V*) *R*.

Test solution. In a 10.0 mL volumetric flask, place 1.0 mL of stock solution, add successively and shake after each addition, 2 mL of *hydrochloric acid 0.5 M,* 2 mL of a solution comprising 100 g/L of *sodium nitrite R* and 100 g/L of *sodium molybdate R*, 2 mL of *dilute sodium hydroxide solution R* and dilute to 10.0 mL with *water R*.

Compensation liquid. In a 10.0 mL volumetric flask, place 1.0 mL of stock solution, 2 mL of *hydrochloric acid 0.5 M* and 2 mL of *dilute hydroxide sodium solution* R. Shake and dilute to 10.0 mL with *water R*.

Reference stock solution. In a 50.0 mL volumetric flask, place 0.010 g of *chlorogenic acid R* and

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dilute to 50.0 mL with *ethanol* (*50 per cent V/V*) *R.*

Reference solution. In a 10.0 mL volumetric flask, place 1.0 mL of reference stock solution. Add successively and shake after each addition, 2 mL of *hydrochloric acid 0.5 M*, 2 mL of a solution comprising 100 g/L of *sodium nitrite R* and 100 g/L of *sodium molybdate R*, 2 mL of *dilute hydroxide sodium solution R* and dilute to 10.0 mL with *water R*.

Reference compensation liquid. In a 10.0 mL volumetric flask, place 1.0 mL of reference stock solution, 2 mL of *hydrochloric acid 0.5 M* and 2 mL of *dilute hydroxide sodium solution R.* Shake and dilute to 10.0 mL with *water R*.

Measure the absorbance of the test solution and the reference solution 5 min after the addition of the last reagent, at 525 nm in comparison with the compensation liquids.

Calculate the percentage content *m/m* of total *ortho*-dihydroxycinnamic derivatives, expressed as chlorogenic acid from the expression :

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

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 chlorogenic acid sample in the reference stock solution in grams,
p = percentage content of chlorogenic acid in *chlorogenic acid R*.

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