CONDURANGO
FOR HOMOEOPATHIC PREPARATIONS

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Marsdenia cundurango ad praeparationes homoeopathicas

Other Latin name used in homoeopathy: **Marsdenia condurango**

DEFINITION

Dried bark of *Marsdenia cundurango* Nichols (*Gonolobus cundurango* Triana).

Content: minimum 0.4 per cent of total hydroxycinnamic derivatives, expressed as chlorogenic acid ($C_{16}H_{18}O_9$; M_r 354.3) (dried drug).

CHARACTERS

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

IDENTIFICATION

A. Cylindar or gutter-like fragments 2 mm to 6 mm thick. Outside surface more or less light brown, usually covered with cracked suber. Light greyish-brown inner side. Fracture: fibrous outside and granular inside. Clusters of sclerous cells displayed as orange-yellow points on the fracture surface.

B. Reduce condurango to a powder (180). Light greyish-brown powder. Examine under a microscope using *chloral hydrate solution R.* Clusters of sclerous cells with yellow, thick polygonal walls, ponctuated with pits; bunched or isolated fibres, 15 to 45 µm in diameter, with thick, pit-free walls; druses of calcium oxalate up to 45 µm in diameter or isolated prismatic cristals; fragments of parenchyma; lactiferous vessels with parenchyma; suber fragments. Examine under a microscope using a mixture with equal volumes of *glycerol R* and *water R.* Numerous round-shaped starch granules, 5 to 16 µm in diameter, single or compound.

C. Thin layer chromatography (*2.2.27*).

Test solution. Add 30 mL of *ethanol* (65 per cent *V/V*) *R* to 3 g of powdered drug (180). Heat under a reflux condenser for 15 min. Allow to cool. Filter.

Reference solution. Dissolve 5 mg of *chlorogenic acid R* and 5 mg of *rutin R* in 10 mL of *methanol 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.

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

Development: over a path of 15 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 in air for about 30 min. Examine in ultraviolet light at 365 nm.

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	
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Chlorogenic acid: a greenish-blue zone	A greenish-blue zone (chlorogenic acid)
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Rutin: an orange zone	Two orange-yellow zones
Reference solution	**Test solution**

TEST

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

Loss on drying (*2.2.32*): maximum 11.0 per cent determined on 1.0 g of powdered drug (180), by drying in an oven at 105 °C for 2 h.

Total ash (*2.4.16*): maximum 12.0 per cent determined on 1.000 g of powdered drug (180).

Adulterations. Absence of starch granules over 16 µm, absence of druses of calcium oxalate or of isolated crystals over 45 µm (different false kinds of bark of condurango).

ASSAY

Ultraviolet and visible absorption spectrophotometry (*2.2.25*).

Test solution. In a round-bottomed flask, place 1.000 g of powdered drug (180), add 40 mL of *ethanol* (65 per cent *V/V*) *R.* Heat under a reflux condenser, on a water-bath at 60 °C for 30 min. Allow to cool. Filter into a 50.0 mL volumetric flask. Rinse the round-bottomed flask with *ethanol* (65 per cent *V/V*) *R.* Dilute to the volume with the same solvent (solution 1). In a 20.0 mL volumetric flask, place successively and shake after each addition, 2.0 mL of solution 1, 4.0 mL of *hydrochloric acid 0.5 M,* 4.0 mL of a solution prepared with the dissolution of 10 g of *sodium nitrite R* and 10 g of *sodium molybdate R* in 100 mL of *water R,* 4.0 mL of *dilute sodium hydroxide solution R* and dilute to 20.0 mL with *water R.*

Compensation liquid: in a 20.0 mL volumetric flask, place successively and shake after each addition: 2.0 mL of solution 1, 4.0 mL of *hydrochloric acid 0.5 M*, 4.0 mL of *dilute sodium hydroxide solution R* and dilute to 20.0 mL with *water R.*

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

Measure the absorbance of the test solution, immediately at 525 nm in comparison with the compensation liquid.

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

$$\frac{A \times 500}{m \times 188}$$

i.e. taking the specific absorbance of chlorogenic acid to be 188 at 525 nm.

A = absorbance of the test solution at 525 nm,
m = mass of the dried drug sample, in grams.

STOCK

DEFINITION

Condurango 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 (65 per cent *V/V)*, using the dried bark of *Marsdenia cundurango* Nichols (*Gonolobus cundurango* Triana).

Content: minimum 0.04 per cent *m/m* of total hydroxycinnamic derivatives, expressed as chlorogenic acid ($C_{16}H_{18}O_9$; M_r 354.3).

CHARACTERS

Appearance: yellow liquid.

IDENTIFICATION

Thin-layer chromatography (*2.2.27*).

Test solution. Mother tincture.

Reference solution. Dissolve 5 mg of *chlorogenic acid R* and 5 mg of *rutin R* in 10 mL of *methanol 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.

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

Development: over a path of 15 cm.

Drying: in air.

Detection: 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 in air for about 30 min. Examine in ultraviolet light at 365 nm.

Results: see below the sequence of fluorescent zones present in the chromatograms of the reference solution and the test solutions. Furthermore other faint fluorescent zones may be present in the chromatogram obtained with the test solution.

Top of the plate	
------	------
Chlorogenic acid: a greenish-blue zone	A greenish-blue zone (chlorogenic acid)
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Rutin: an orange zone	Two orange-yellow 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 1.0 per cent *m/m*.

ASSAY

Ultraviolet and visible absorption spectrophotometry (*2.2.25*).

Mother solution. In a 50.0 mL volumetric flask, place 10.00 g of mother tincture. Dilute to 50.0 mL with *ethanol* (65 per cent *V/V) R.*

Test solution. In a 20.0 mL volumetric flask, place successively and shake after each addition: 2.0 mL of mother tincture, 4.0 mL of *hydrochloric acid 0.5 M*, 4.0 mL of a solution prepared with the dissolution of 10 g of *sodium nitrite R* and 10 g of *sodium molybdate R* in 100 mL of *water R,* 4.0 mL of *dilute sodium hydroxide solution R* and dilute to 20.0 mL with *water R.*

Compensation liquid: in a 20.0 mL volumetric flask, place successively and shake after each addition, 2.0 mL of mother tincture, 4.0 mL of *hydrochloric acid 0.5 M,* 4.0 mL of *dilute sodium hydroxide solution R* and dilute to 20.0 mL with *water R.*

Measure the absorbance of the test solution, immediately at 525 nm in comparison with the compensation liquid.

Calculate the percentage content *m/m* of hydroxycinnamic derivatives expressed as chlorogenic acid, from the expression:

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

$$\frac{A \times 500}{m \times 188}$$

i.e. taking the specific absorbance of chlorogenic acid to be 188 at 525 nm.

A = absorbance of the test solution at 525 nm,
m = mass of the mother tincture sample, in grams.

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