COMMON OAT
FOR HOMOEOPATHIC PREPARATIONS

AVENA SATIVA
FOR HOMOEOPATHIC PREPARATIONS

Avena sativa ad praeparationes homoeopathicas

DEFINITION

Fresh, blooming aerial parts of *Avena sativa* L.

IDENTIFICATION

A. Erect stem, cylindrical, glabrous, measuring up to 1 m high. Alternate leaves; flat, linear, lanceolate, scabrous on the lamina margin, sheathing; glabrous with a short ligule. Erect panicle inflorescence, pyramidal, loose, consisting of pendulous spikelets about 20 mm long with two fertile flowers each. Lanceolate glumes with 7-9 veins, somewhat equal, outgrowing the flowers; glumellas finely veined, somewhat equal, coriaceous lower glumella with bi-dentate apex, the one from the lower flower of the spikelet usually shows a twisted back and knelt awn about twice the size of the glumes. Three-stamen flower with medifixed anthers. Unilocular ovary ciliate at the top and ending with 2 feathery stigmas.

B. Take a sample of epidermis from the underside of the leaf. Examine under a microscope, using *chloral hydrate solution R:* lamina epidermis consisting of rectangular cells with thin cell-walls, aligned in rows parallel to the vein, some rows consisting alternatively of rectangular cells and stomata with markedly thickened cell-walls on either side of the ostiole, and two subsidiary cells of paracytic type (*2.8.3*); epidermis from the veins comprising rows of rectangular cells aligned along the vein, some rows alternatively composed of cells and covering trichomes; unicellular, covering trichomes with thickened cell-walls, enlarged at the base and ending with a short tip directed towards the base of the leaf and parallel to the vein.

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.

Avena elatior: The presence of 7-10 mm long spikelets and the presence of uneven glumes with 1-3 veins show adulteration by *Avena elatior* L.

STOCK

DEFINITION

Common oat mother tincture is prepared with ethanol (45 per cent *V/V*) using the fresh, blooming

---

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

aerial parts of *Avena sativa* L.

Content: minimum 0.015 per cent *m/m* of *trans*-aconitic acid ($C_6H_6O_6$; M_r 174.1).

PRODUCTION

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

CHARACTERS

Appearance: yellowish-green liquid.

IDENTIFICATION

A. Thin layer chromatography (*2.2.27*).

Test solution. Mother tincture.

Reference solution. Dissolve 10 mg of *rutin R* and 5 mg of *luteolin R* in 40 mL of *ethanol* (*96 per cent*) *R*.

Plate: *TLC silica gel plate R*.

Mobile phase: *glacial acetic acid R*, *water R, butanol R* (10:10:40 *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 spray 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: 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	
Luteolin: an orange zone	An orange zone
-----	-----
Rutin: an orange zone	A greenish-yellow zone
-----	-----
Reference solution	**Test solution**

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

TESTS

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

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

ASSAY

Liquid chromatography (*2.2.29*).

Test solution. In a 20.0 mL volumetric flask, place about 2.000 g of mother tincture accurately weighed and dilute to 20.0 mL with a mixture of 10 volumes of *methanol R* and 90 volumes of *trifluoroacetic acid* (0.1 per cent *V/V) R.*

Reference solution. In a 100.0 mL volumetric flask, dissolve 35.0 mg of *trans-aconitic acid R* in a mixture of 10 volumes of *methanol R* and 90 volumes of *trifluoroacetic acid* (0.1 per cent *V/V*) *R* and dilute to 100.0 mL with the same solvent. In a 20.0 mL volumetric flask, place 2.5 mL of the previous solution and dilute to 20.0 mL with a mixture of 10 volumes of *methanol R* and 90 volumes of *trifluoroacetic acid* (0.1 per cent *V/V*) *R.*

Column:
- *size*: *l* = 0.25 m, *Ø* = 4 mm,
- *stationary phase*: *octadecylsilyl silica gel for chromatography R* (5 µm).
- *room temperature.*

Mobile phase:
- *mobile phase A*: *trifluoroacetic acid* (0.1 per cent *V/V*).
- *mobile phase B*: *methanol* R_2.

Time (min)	Mobile phase A (per cent *V/V*)	Mobile phase B (per cent *V/V*)
0	90	10
10	90	10
20	0	100

Flow rate: 1.0 mL/min.

Detection: spectrophotometer at 220 nm.

Injection: 10 µL.
Retention time: *trans*-aconitic acid: about 5 min.

Calculate the percentage content *m/m* of *trans*-aconitic acid in the mother tincture, from the expression:

$$\frac{A_1 \times m_2 \times 0.025 \times p}{A_2 \times m_1}$$

A_1 = area of the peak due to *trans*-aconitic acid in the chromatogram obtained with the test

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

solution,

A_2 = area of the peak due to *trans*-aconitic acid in the chromatogram obtained with the reference solution,

m_1 = mass of the mother tincture sample, in the test solution, in grams,

m_2 = mass of the sample of *trans*-aconitic acid in the reference solution, in grams.

p = percentage content of *trans*-aconitic acid in *trans-aconitic acid R*.

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