

# IDENTIFICATION OF AMINO ACIDS IN AVENA SATIVA AS AN ADDITIONAL STANDARDS IN STATUTORY CONTROL OF TINCTURE

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**ABSTRACT:** A paper chromatography method to identify the essential amino acids namely lysine, (3, 4 dihydroxy phenyl) alanine, tryptophan and valine in homoeopathic tincture of *Avena sativa*.

## INTRODUCTION

A preparation from the seeds of *Avena sativa* Linn. (Fam: Gramineae) is official in *Homoeopathic Pharmacopoeia of India*<sup>1</sup>, *United States Homoeopathic Pharmacopoeia*<sup>2</sup> and others. It is used as a nervine tonic, in nerve tremors of aged paralysis agitans, alcoholism and is reported to have a selective action on brain and nervous system favourably influencing their nutritive functions<sup>3</sup>.

The action of homoeopathic mother tinctures of *Avena sativa* is comparable to certain amino acids. Since the physicochemical constants like specific gravity, alcohol content, total solid, pH etc. were not sufficient to ensure the therapeutic value of the drug, the presence and identification of different amino acids were undertaken to propose additional statutory standards for the mother tinctures of *Avena sativa*.

*Avena sativa* is reported to contain vitamin B<sub>1</sub><sup>4</sup>, and acenin<sup>5</sup>.

## METHOD AND MATERIAL

**Standard sample:** The tincture from *Avena sativa*, the raw drug procured from the market and pharmacognostically identified<sup>6</sup>, was prepared as per method laid down in *Homoeopathic Pharmacopoeia of India*. This was marked 'S'.

**Commercial samples:** Three commercial samples of *Avena sativa* were procured from different sources of the market. These were marked C<sub>1</sub>, C<sub>2</sub> and C<sub>3</sub>.

**Reference standards of Amino acids:** A kit of reference standard amino acids was procured from B.D.H. Chemical Ltd. England, Product no. 32016. These reference standards were dissolved in ethanol and numbered suitably.

**Solvent system:** n-butanol: acetic acid: water (4:1:1 v/v).

**Spraying reagent:** 0.1% solution of ninhydrin in acetone.

All the reagents used above were of chromatography grade.

**Method:** 10 ml of the tincture was refluxed with 5 ml of 6N hydrochloric acid for sixteen hours on a water bath. The hydrolysate was filtered to remove any suspending matter.

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The filtrate was evaporated to dryness and dried repeatedly after adding water intermittently to expel off any excess of hydrochloric acid. The residue was dissolved in ethanol and the solution was spotted on a paper preliminary chromatogram. Descending chromatography technique was followed using n-butanol: acetic acid: water (4:1:1 v/v) as the mobile phase. Paper chromatogram was sprayed with ninhydrin solution. The Rf values of the spots detected on the chromatogram are given in the following table.

Rf values of the spots detected on paper chromatography of *Avena sativa* tincture

S	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>
0.04	0.04	0.04	0.04
0.1	0.1	0.1	0.1
0.2	0.2	0.2	0.2
0.4	0.4	0.4	0.4
0.54	0.54	0.54	0.54

## RESULTS

The spots with Rf value 0.04, 0.1, 0.2, 0.4 and 0.54 corresponded to L-cystine; lysine; 3,4 dihydroxyphenyl alanine, tryptophan, and valine which were confirmed by the identical spots of their reference standards developed on the same chromatogram after dissolving them in ethanol under identical conditions of experiment. L-cystine has not been reported to possess any neurotropic activity whereas, other essential amino acids having such activity namely lysine, tryptophan, valine and 3,4 dihydroxyphenyl alanine, usually abbreviated as Dopa, were identified. Coincidentally Dopa, acts as chemical transmitter in CNS as stimulant and is responsible for the production of nor-epinephrine. Tryptophan (official in *Japan Pharmacopoeia*) has been reported to be as effective as imipramine in acute depression. Tryptophan along with pyridoxine has been used in treatment of depression. Also tryptophan in combination with Dopa has been used in the treatment of Parkinsonism.

The presence of amino acids was established and the individuals were identified. Incidentally the reported action of the homoeopathic tincture favourably corresponds to the reported action of the individual identified amino acids and as such this can well serve as statutory standards for the tincture of *Avena sativa*.

## REFERENCES

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