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Phyto-Chemical Study of the Roots of Adiantum Lunulatum Burn

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Abstract: *The protein obtained from the roots of Adiantum lunulatum-Burn on ascending paper chromatographic analysis was found to consist of various amino acids. The detection of the bioactive principles present in the medicinal plants and subsequently may lead to discovery and development of drugs.*

Keywords: *Adiantum lunulatum-Burn protein paper chromatography, amino acids.*

1. Introduction

The plant Adiantum lunulatum-Burn[1], belongs to natural order Polypodiaceae. It is commonly known as kali jhant in Hindi, Hansraj in Bombay and Hansavati in south India. It is reported to be useful for getting relief from fever and also for curing erysipelas. The dried whole plant has been used as a medicine for bronchitis and cough. It is used in bleeding diseases, burning sensation, erysipelas, epileptic fits, dysentery, strangury and elephantiasis. Few studies have been undertaken till date to substantiate its pharmacological activities such as antibacterial, antifungal, antioxidant, hypotensive etc. The plant is distributed throughout in northern India, in most places of south India and very general on western side in plains and lower slopes of India. In view of its so important medicinal values, the amino acids composition of its roots were studied.

2. Experimental

2.1. Isolation of the Protein

About (150g) of the air dried and powdered roots of Adiantum lunulatum-Burn were defatted with petroleum ether ($40\text{-}60^0$) in a soxhlet extractor. The defatted and powdered roots were then treated with brine solution (10% sodium chloride solution) and subjected to maceration. Thereafter the contents were centrifuged and the supernatant liquid was decanted. This process was repeated till the supernatant liquid stopped giving positive Biuret test. All the supernatant liquids were combined, and in this combined extract, 6N-HCl was added when the crude protein precipitated out, which was separated by centrifugation. This crude protein (20g) was subjected to hydrolysis by refluxing it with (50 ml) of 6-N-HCl for about (24 hour) at 100^0C.

The contents of the hydrolysis were dissolved in 40 ml of water followed by filtration. The filtrate was concentrated to dryness. The excess of acid was removed by repeating the process of dissolving in water and again to completely evaporating it. In the last it was dissolved in 15% isoproponol.

2.2. Chromatography of Amino Acid

This isopropanol solution was subjected to ascending paper chromatography using upper layer of solvent system; n - Butanol: Acetic acid and water (4:1:5) on Whatman No-1 filter paper. The developled chromatogram was sprayed with Ninhydrine in 90% butanol and 5% N-acetic acid. The amino acids were identified by Co-chromatography and comparing their R_f values with the R_f values of authentic samples of amino acids.

3. Results And Discussion

The amino acids which were identified on the above experimental basis are tabulated below[2,3].

Table.

S.No.	R_f of Authentic	R_f Observed	Amino Acid Identified
1.	0.13	0.13	Alanine
2.	0.19	0.19	Glycine
3.	0.25	0.25	Valine
4.	0.28	0.27	Proline
5.	0.32	0.31	Leucine
6.	0.37	0.38	Tyrosine

The perusal of the above table concluded that the protein of the root of Adiantum lunulatum-Burn consisted of Alanine, Glycine, Valine, Proline, Leucine and Tyrosine.

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