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Preliminary screening of amino acids from a medicinal plant: *Morinda pubescence*

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ABSTRACT

Morinda pubescence, one of the important plants of Rubiaceae family, is a small tree distributed through out the tropics. It is one of the most important species used in Ayurveda for the treatment of different diseases. The plant parts are used as cathartic, febrifuge, healing of ulcers, throat complaints, dysentery, leucorrhoea and sapromia and tonic. Amino acids play a vital role in the metabolism of secondary metabolites. Taking into consideration the above facts the chemical analysis of various extracts of the leaves was performed to detect the presence of amino acids. The amino acids were identified by paper chromatographic method using varied solvent systems. The presence of amino acids was determined by comparing with standard amino acids.

Key words: *Morinda pubescence,* amino acids, paper chromatography.

INTRODUCTION

Study of plant species for different medicinal resources is creating an increasing impact on today's era. The rapid development of different analytical techniques in recent years has enabled investigators to tackle some of the most challenging and fundamental problems in plant study and herbal medicine. Herbal and herbo-mineral medicines have been used for thousands of years. In India this knowledge attained in well organized form was systematically recorded and employed as a traditional health care system called Ayurveda. In Ayurvedic system of medicines *M. pubescence* has a great value [1]. Genus "Morinda" is known to elaborate a number of anthraquinones [2], both in a free condition and in the form of glycosides. The roots are used as cathartic [3-5] and febrifuge and applied externally to relieve pain in gout. Leaves are considered

as tonic [6] and febrifuge. These are used in healing application for wounds and ulcers. The juice of leaves is externally applied in gout[7].Fruits are used for spongy gums, throat complaints, dysentery, leucorrhoea and sapraemia[8].The coloring principle of plant root is present in the bark mainly as the glucoside [9-11].Literature survey revealed the presence of anthraquinones[12, 13]. Amino acids are the basic structural and functional units of proteins, thus amino acids have immense importance in the herbal medicines.

Plant material

The plant material was collected from Pune, Maharashtra; India. It was authenticated by comparing with herbarium specimen preserved in Agharkar Research Institute, Pune Maharashtra, India. Its authentication No. is AHMA-21220

EXPERIMENTAL SECTION

Air shade dried and pulverized material of leaves was used for experiment. Extracts were prepared by using different solvents such as chloroform, acetone, ethanol and water. Whatmann filter paper (No. 1) was used for paper chromatography. Various mobile phases were tried to screen out the best phase for separation of the amino acids present in the plant material by paper chromatographic technique. The suitable mobile phase was found to be as:
Pyridine: Iso propyl alcohol: Acetic acid: Water (8:8:1:3).

Table 1- Detection of Amino acids from acetone extract of leaves
Mobile phase: Pyridine: Isopropyl Alcohol: Acetic acid: Water (8:8:1:3)

Name of amino acids	R_f for standard amino acids	R_f for amino acids from acetone extract
Glutamic acid	0.22	0.23
Valanine	0.53	0.53

Table 2- Detection of Amino acids from Chloroform extract
Mobile phase: Pyridine: Isopropyl Alcohol: Acetic acid: Water (8:8:1:3)

Name of amino acids	R_f for standard amino acids	R_f for amino acids from Chloroform extract
Histidine	0.10	0.12
Glutamic acid	0.22	0.24
Proline	0.41	0.40
Phenyl-alanine	0.60	0.68

Table 3- Detection of Amino acids from Ethanol extract
Mobile phase: Pyridine: Isopropyl Alcohol: Acetic acid: Water (8:8:1:3)

Name of amino acids	R_f for standard amino acids	R_f for amino acids from Ethanol extract
Butyric acid	0.46	0.47

The extract was transfer separately on the chromatographic paper along with standard samples. The mobile phase was allowed to run to a certain height and the chromatogram was dried at room temperature. Ninhydrine, a spraying reagent, (1.75 g in 15 ml acetone) was sprayed on the chromatographic paper and dried at room temperature. The R_f values of the amino acids of the experimental samples were determined and compared with the standard amino acids. Different extract show presences of different amino acids are reported in table no**.[1-4].**

Table 4- Detection of Amino acids from Water extract
Mobile phase: Pyridine: Isopropyl Alcohol: Acetic acid: Water (8:8:1:3)

Name of amino acids	R_f for standard amino acids	R_f for amino acids from Water extract
Histidine	0.10	0.10
Glutamic acid	0.22	0.19
Serine	0.22	0.27
Threonine	0.36	0.36
Butyric acid	0.46	0.45

RESULTS AND DISCUSSION

Amino acids play central roles both as building block of proteins and as intermediates in metabolism and their presence was detected by using paper chromatographic technique. Leaves of *M.pubescence* were found to be a rich source of various amino acids. The amino acid study showed the presence of glutamic acid, Valanine, histidine, serine, proline, phenyl-alanine, threonine, butyric acid. Above results show that the aqueous extract of leaves of *M. pubescence* is having higher number of amino acids than the chloroform and ethanol extract where as ethanol extract contains only one amino acid i.e. butyric acid. Chloroform extracts shows presence of histidine, glutamic acid, proline, phenyl alanine. Histidine and glutamic acid are present in both chloroform and water extract while butyric acid is present in ethanol as well as water extract. The R_f values of the amino acids from extracts are compared with the standard amino acids.

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REFERENCES

[1] IH Burkill. A Dictionary of the Economic Products Of The Malay Peninsula, 2nd Edition, Crown Agents for the colonies Publishers & Distributer, London **,1935**.
[2] M Rao. Flowering Plants of Travancore, Govt. Press Publishers & Distributer, Trivandrum, **1914.**
[3] Thorpe.Thorpe's Dictionary of Applied Chemistry, 4th Edition, Longmans, Green and Co Publishers & Distributer; London, **1945**-56.
[4] KR Kirtikar, BD Basu, E Blatter, JF Caius ,KS Mhaskar, kirt and Basu.Indian Medicinal Plants , 2nd Edition, Lalit Mohan Basu Publishers & Distributer, Allahabad, **1935.**
[5] H Finnemore. The Essential oils, Ernest Benn Ltd., London, **1926**.
[6] PK Mukherjee. Quality Control of Herbal drugs, 4th Edition, London, **1945-56.**
[7] F Mayer, AH Cook. The Chemistry of Natural Colouring Matters, Reinhold Publishing Corp., New York, **1943.**
[8] The Ayurvedic Pharmacopoeia of India, Part-1, first Edition, Controller of Publications, India, **2001**, 88.
[9] AG Perkin, AE Everest. The Natural Organic Colouring Matters, Longmans, Green and Co., London, **1918.**
[10] Bhattacharya and Simonsen; *J. Indian Inst*. Sci., **1927**, 10 A, 6
[11] AL Lehninger, DL Nelson, MM Cox. Principles of Biochemistry, CBS

[12] I Heilbron, H M Bunbury. Dictionary of Organic Compounds, Eyre and Spottiswoode, London, 4 vols. **1953**.
[13] PS Rao; V Reddy; *Indian J.chem*. 15B, **1977**, 497.