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NOTE

Study of Amino Acids and Carbohydrates from The Leaves of *Ehretia laevis*

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An Indian traditional medicinal plant, *Ehretia laevis* Roxb. commonly called Bhokara belongs to family Boraginaceae. All parts of the plant are medicinally important. They are used in dropsy, anasaraca, urticaria, cholera, dysentery, *etc*. Detection of amino acids from two different extracts was carried out using paper chromatographic technique. Both extracts showed presence of different amino acids. These were compared with the standards. Presence of carbohydrates was performed using paper chromatographic techniques and compared with the standards.

Key Words: *Ehretia laevis*, Amino acids, Carbohydrates, Paper chromatography.

In Ayurveda, the Indian indigenous system of medicine, has been an integral part of Indian culture. For raising Ayurvedic system of herbal medicine to world, it is essential that each component or the factor of the system should be critically studied and made perfect. The treatments for various diseases are reported in Ayurvedic system of medicine. Medicinally important natural products are of immense use.

Ehretia laevis is a small tree. It is generally found in Asia and Australian tropics[1]. Literature survey revealed wide biological activity of family Boraginaceae.The inner bark, is used as food[1]. Leaves are applied to ulcers and in headache[2]. Fruit is astringent, anthelmintic, diuretic, demulcent, expectorant and used in affections of urinary passages, diseases of lungs and spleen[2]. Powdered kernel mixed with oil is a remedy in ringworm[2]. Seeds are anthelmintic[2].

The presence of amino acids and carbohydrates have been studied and compared with the standards by using paper chromatographic techniques with different mobile phases.

Authentication of *Ehretia laevis*, Roxb, was done by comparing with herbarium specimens preserved in Botanical Survey of India, Pune (Maharashtra), India. Its authentication No. is BSI/WC/Tech/2006/185.

Determination of amino acids: Air shade dried material of leaves was used for experiment. Extracts were prepared by using different solvents such as acetone,

ethanol and water. Whatmann filter paper No. 1 was used for paper chromatography. Various solvent systems were tried to screen out the best mobile phase for separation of the amino acids present in the plant material by paper chromatographic technique. Pyridine:iso propyl alcohol:acetic acid:water (8:8:1:3) solvent system was found the suitable one.

The extracts were spotted 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 of ninhydrine 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 standards (Table-1).

TABLE-1
PYRIDINE:ISOPROPYL ALCOHOL:ACETIC ACID:WATER (8:8:1:3)

Name of amino acids	R_f value for standard amino acids	R_f value of plant extract	
		B1	B2
Butyric acid	0.570	0.580	0.570
Ornithine	0.028	0.030	–
Cysteine	0.550	0.540	–
Histidine	0.570	0.600	–
Arginine	0.140	–	0.150
Serine	0.170	0.160	–
Hydroxy proline	0.460	0.440	–
Glutamic acid	0.230	0.240	–
Proline	0.590	0.580	–
Lysine	0.110	0.120	–
Tryptamine	0.930	–	0.930

B1 = Amino acids detected in water extract; B2 = Amino acids detected in acetone extract.

Determination of carbohydrates: The air shade dried powdered material of *Ehretia laevis* leaves (5 g) was mixed with fixed quantity of calcium carbonate in distilled water (40 mL) and heated on water bath for 2 h. The aqueous extract was separated by decantation and the powder was further heated three times with distilled water on water bath. The aqueous filtrate was combined and 10 % w/v solution of lead acetate was added till the precipitate obtained. The solution was filtered, small quantity of ammonia was then added to the filtrate and then H_2S gas was bubbled through the filtrate in order to remove lead acetate as lead sulfide. Lead sulfide wass removed by filtration. The neutral solution of filtrate obtained was concentrated over water bath under reduced pressure to a gummy mass of carbohydrates[3].

Whatmann filter paper No. 1 was used for paper chromatography. Various solvent systems were tried to screen out the best mobile phase for separation of the carbohydrates present in the plant material by paper chromatographic technique. Isopropyl alcohol:pyridine:acetic acid:water (8:8:1:3)[3,4] solvent system was found the suitable one.

The extracts were spotted 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. The specific spraying reagent, aniline-hydrogen phthalate[5] was used to develop the chromatogram. The R_f values of the test sugars were confirmed by comparing with the R_f values of authentic sugars (Table-2).

TABLE-2
ISOPROPANOL:PYRIDINE:ACETIC ACID:WATER (8:8:1:3)

Carbohydrates	R_f value for Standard Carbohydrates	R_f value for plant sample
Mannitol	0.22	0.22
Maltose	0.42	0.40
Lactose	0.54	0.52
Insulin	0.17	0.18

Study of plant species for different medicinal resources is creating a measuring impact on todays era. The rapid development of different analytical techniques in recent years has enabled investigators to talk some of the most challenging and fundamental problems in plant study and herbal medicines.

The amino acids are basic units of proteins and therefore their presence was detected. Leaves of *Ehretia laevis* were found to be a rich source of various amino acids. The amino acid study showed the presence of butyric acid, ornithine, cysteine, histidine, argenine, serine, hydroxy prolin, prolin, glutamic acid, lysine and tryptamine.

The detection of carbohydrates showed the presence of mannitol, maltose, lactose and insulin.

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