

# Detection of Amino Acids Present in the Leaves of *Cassia auriculata L.*

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**Abstract:** *Cassia auriculata L* is small perennial shrub growing widely in dry regions of central India, Western Peninsula and western Rajasthan. The bark is astringent and is valuable tanning material. Fruits are anthelmintic, Flowers and pods are used in diabetes and urinary disorders. Most of the plants of this genus *cassia* are well known in Indian system of medicine for their cathartic, purgative and antibiotic properties. Many compounds of structural significance and medicinal importance have been reported from different species of this genus. Leaves of *cassia auriculata L* are useful in chronic fever, anthelmintic. Taking into consideration amino acid content was found out. Air shade dried powdered material of leaves were used for the detection of amino acids from *CASSIA AURICULATA L*. Paper chromatographic technique was used with different mobile phases. Specific amino acids were detected specific mobile phases. The obtained amino acids were identified by comparing with standards. Total ten amino acids in the leaves were detected. Two mobile phases found suitable for the amino acids present in the leaves.

Key words: *Cassia auriculata L*, Paper chromatography, amino acids, Rf values.

## INTRODUCTION

*Cassia auriculata L* is small perennial shrub growing widely in dry regions of central India, Western Peninsula and western Rajasthan. The bark is astringent and is valuable tanning material.<sup>1</sup> Fruits are anthelmintic, Flowers and pods are used in diabetes and urinary disorders.<sup>2</sup> Most of the plants of this genus *cassia* are well known in Indian system of medicine for their cathartic, purgative and antibiotic properties.<sup>3</sup> Many compounds of structural significance and medicinal importance have been reported from different species of this genus.<sup>4</sup> Leaves of *cassia auriculata L* are useful in chronic fever, anthelmintic. It is also good for ulcers, leprosy, skin diseases.<sup>5</sup> Several reports were available on biological activity of *cassia auriculata L*.<sup>6,7</sup> Antimicrobial activity of metal

complexes prepared from the isolated compounds of *cassia auriculata L* was reported.<sup>8</sup> However no report on investigation of the amino acids pattern from the leaves of *cassia auriculata L* is available in literature. Amino Acids are the "building Blocks" of the body. There are about 28 amino acids commonly referred to in human health. They are required by the body as it acts as a precursor. Eight amino acids are essential for humans as phenylalanine, valine, threonine, tryptophan, isoleucine, methionine, leucine, and lysine.<sup>8</sup> Additionally, cysteine, tyrosine, histidine and arginine are required by infants and growing children.<sup>8</sup> Essential amino acids are does not synthesize body. In addition, the amino acids arginine, cysteine, glycine, glutamine, histidine, proline, serine and tyrosine are considered conditionally essential, meaning they are not

normally required in the diet, but must be supplied exogenously as are useful components in a variety of metabolisms. It is important to be aware that amino acids are part of complex pathways and biological systems. Deficiency of amino acid cause weak immune system, loss of antibody production, fatigue, stomach acid/alkaline imbalance, dizziness/nausea, water retention, Considering the fact , investigation of amino acids from the leaves has been carried out.

### EXPERIMENTAL

Whatmann No. 1 filter paper was used for paper chromatography .Amino acids kit (CHH laboratory reagent) was used for standard amino acids. Leaves of *Cassia auriculata L* were collected from Western Pune Maharashtra, India, shade dried authentication was done by comparing with herbarium specimens preserved in Botanical Survey of India, Pune(Maharashtra), its authentication no is BSI/WC/Tech/2009/95 and powdered. Three extracts were prepared by using weighed quantity of powdered material in known volume of water, 9% (w/v) aqueous sodium chloride solution and ethanol. Extraction procedure was repeated three times using chloroform to remove chlorophyll. The chlorophyll layer was separated and the remaining part was used for amino acid analysis<sup>9</sup>.Ten Amino acids were detected and identified from leaves using ninhydrin spray. Different mobile phases were tried to screen out the best mobile phase for separating the amino acids present in the leaves by paper chromatographic technique. Out of these mobile phases, two mobile phase were found suitable for the leaves. The experimental extracts were

spotted on the chromatographic paper along with standards samples. The mobile phase was allowed to run to a certain height and the chromatogram was dried at room temperature. The  $R_f$  values of the amino acids of the experimental samples were determined and compare with the standards. Tables 1, 2 below enlist the amino acids present in the leaves of the plant.

### RESULTS AND DISCUSSION

Qualitative determination of amino acids from chromatogram specified L- Cystine, DL-Alanine, L- Proline, L-Leucine, DL-Isoleucine methionine are major constituents and D-Threonine, L-Ornithrine hydrochloride, Aspartic acid, Hydroxyproline, Glycine were minor constituents observed using mobile phase butanol : acetic acid : water (6:4:2) and n-butanol-ethanol-water-pyridine-ammonia(4:2:1:2:1). The remaining were negligible amount. Total ten amino acids were present. Among these amino acids the L- Leucine, D-Threonine, DL-Isoleucine methionine are essential aminoacids whereas L-Cystine, DL-Alanine, Lproline, Glycine, Hydroxyproline, Aspartic acid, L-Ornithrine hydrochloride are non essential amino acids.

Skin, as well as detoxification of body, requires cysteine. It not only is important in collagen production but also assists in skin elasticity and texture. It can help slow down the aging process, deactivate free radicals, neutralize toxins, aids in protein synthesis and presents cellular change. It is necessary for the formation of the skin, which aids in the recovery from burns and surgical operations, all these thing can definitely related to the use of powdered leaves in skin disease.

**Table-1 Amino acids detected in mobile phase1-Butanol : Acetic acid :Water(6:4:2)**

Name of the amino acids	$R_f$ values .	
	Std .Amino acids	Amino acids in leaves
L- Cystine	0.070	0.071
DL-Alanine	0.420	0.420
L-Proline	0.560	0.561
DL-Isoleucine methionine	0.650	0.660
L-Leucine	0.940	0.950
Glycine	0.034	0.034
Hydroxyproline	0.058	0.058

**Table-2 Amino acids detected in mobile phase 2- n-Butanol-ethanol-water-pyridine- ammonia(4:2:1:2:1)**

Name of the amino acids	$R_f$ values .	
	Std .Amino acids	Amino acids in leaves
Aspartic acid	0.038	0.037
L-Ornithrine hydrochloride	0.050	0.058

D-Threonine	0.200	0.200
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L-alanine is an important source of energy for muscle tissue, the brain and central nervous system; strengthens the immune system by producing antibodies; helps in the metabolism of sugars. L-proline is extremely important for the proper functioning of joints and tendons, also helps maintain and strengthen heart muscles ,helps trigger the release of oxygen to the energy requiring cell-making process; it is important in the manufacturing of hormones responsible for a strong immune system.

L-aspartic acid aids in the expulsion of harmful ammonia from the body. Recent studies have shown that it may increase resistance to fatigue and increase endurance. L-ornithine is important since it induces the release of growth hormone in the body, which in turn helps with fat metabolism and further required for a properly functioning immune system and liver, and assists in ammonia detoxification and liver rejuvenation. It is also of use in healing and repairing skin and tissue and is found in both these body parts.

L-leucine provides ingredients for the manufacturing of other essential biochemical components in the body,

some of which are utilized for the production of energy, stimulants to the upper brain and helping you to be more alert. L-threonine is an important constituent of collagen, elastin, and enamel protein, helps prevents fat build-up in the liver, helps the digestive and intestinal tracts function more smoothly, assists metabolism and assimilation.

L-isoleucine provides ingredients for the manufacturing of other essential biochemical components in the body, some of which are utilized for the production of energy, stimulants to the upper brain and helping you to be more alert. Leucine is beneficial for skin, bone and tissue wound healing. It promotes growth hormone synthesis which is essential for healthy nervous system function. Methionine is antioxidant, it helps in breakdown of fats and aids in reducing muscle degeneration. It is also good for healthy skin and nail. Alanine beneficial for healthy nervous system. It boosts memory and learning. It may be useful against depression and suppressing appetite. Hence present amino acids are definitely related to the use of this plant from ancient days.

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