Short Communication

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Amino Acid Composition of *Grewia asiatica* (Falsa) as Index of Juice Quality

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Grewia asiatica, commonly known as 'Falsa' was studied for the amino acid composition. Amino acids of pulp and seeds were found to exhibit very specific ratio.Glutamic acid and alanine were absent in extracts of seeds while the hydrolysate of seeds contained large amount of glycine and tyrosine, however their absence in pulp hydrolysate was specially significant.

The fruit juices are generally highly priced, so it is tempting to adulterate them with cheaper ingredients or more sophisticated methods like mingling of proteins hydrolysate, low cost amino acids, or other fruit juices of inferior quality [1].

Rozen [2] suggested that amino acid analysis may be a useful tool for determining the identity and quality of fruit drinks.The concentration profile of free amino acids has been found significant to detect the adulteration of citrus juice.

The sophisticated techniques involved in estimation of amino acids [3] including amino acid analyser [4] have further encouraged the application of methodology in assessing the quality of fruit juice.

Importance of free amino acid in fruit juices has been recognized only decade and half ago [5,6], they were regarded as useful indicators for authenticity of juice. Amino acids profile can also be used in indentification of variety of the same fruit e.g. amino butyric acid is present only in Valencia orange while Novel orange do not have it. Wallrauch [7] reported that passion fruit juices is rich in serine and alanine while proline level is high in pear juice [8]. The specificity in ratio of amino acid is thus another way of determining the degree of adulteration [9].

The present paper deals with the analysis of amino acids of pulp and seeds of *G. asiatica* and its significance in determining the degree of adulteration in Falsa fruit juice.

Analytical reagent grade chemicals and double distilled water were used throughout the experimentation. Protein content was estimated by micro Kjeldahl methods.

Free amino acids in exudate of pulp and seed were analyzed after precipitation of proteins by adding 10% sulfosalicylic acid to the known quantity of juice in ratio of 1:1. The mixture was shaken vigorously and kept for 30 min. at 4° and finally centrifuged at 3000 g. The clear supernatant (25 ul) was subjected to analysis using automatic amino acids analyzer (LC- 6001 Biotronic GmbH) for quantitation.

Amino acids were estimated after hydrolyzing the pulp and seed's proteins separately with 6N HCl in sealed glass tubes incubated at 110° for 20 hrs. Finally HCl was removed in vacuum and aimno acids were analyzed by the automatic amino acids analyzer.

The amino acids found in the hydrolyzed and unhydrolyzed (free amino acid) juice of Falsa pulp and seed presented in Table 1 revealed some interesting and significant observations.

While evaluating the essential amino acids it was found that threonine is found in pulp while it is missing in seeds extract, on the other hand methionine is present in seeds indicating that adulteration of seed's solution in Falsa juice may be detected by presence of methionine. The presence of valine as free amino acid in traces only in the pulp may be

TABLE 1. AMINO ACID COMPOSITION OF FALSA FRUIT.

Amino acids	Pulp (m.mole/100g)		Seeds (m.mole/100g)	
	FAA	Hydrolyzate	FAA	Hydrolyzate
Serine	7.33	4.45	58.68	–
Proline	3.68	–	19.92	–
-Amino butyric acid	–	–	11.62	–
Methionine	–	–	7.2	14.26
Histidine	–	2.43	3.06	0.38
Valine	1.65	–	–	4.03
Isoleucine	1.35	–	7.74	–
Leucine	1.24	–	8.42	–
Tyrosine	1.73	–	7.5	47.6
Phenylalanine	2.87	–	–	4.21
Glutamic acid	–	40.31	–	–
Threonine	2.76	6.69	–	–
Glycine	3.19	–	14.82	62.51
Alanine	1.40	–	27.88	–
-Alanine	0.86	–	–	–
Lysine	–	28.79	6.74	0.38
Aspartic acid	–	40.31	–	–
Phophoserine	8.23	–	22.82	–
Taurine	5.41	–	13.38	–
Cystein	1.70	–	–	–

FAA = Free amino acid., – = Not detected

meaningful and projects its inability in peptide formation as it is absent in the hydrolysate. Moreover the seeds do not contain any valine indicating that its further difussion towards interior is either restricted or it is soon assimilated. Only the juice and hydrolysate of seeds are found to contain traces of phenylalanine showing the participation of the free amino acid in building of seed proteins. The lysine is absent as amino acid in pulp but largely accumulated in pulp proteins Table 2. The leucine and isoleucine are only present as free amino acid being neither involved in pulp nor in seed protein bio-synthesis. The non-essential amino acids alanine, phosphoserine and taurine behave in a similar way.

TABLE 2. FREE AMINO ACIDS IN FALSA JUICE (m.mol/100ml).

Phosphoserine	19.59
Taurine	13.07
Threonine	6.57
Serine	17.45
Proline	8.76
Glycine	7.59
Alanine	3.33
Isoleucine	3.21
Tyrosine	4.11
Phenylalanine	6.83
Valine	3.92
Cysteine	4.04
Leucine	2.95
B-Alanine	2.04

Histidine like lysine is found in hydrolysate of pulp and seed as well as freely in seed extracts showing it's prompt involvement in assimilation and diffusion. The aspartic and glutamic are acidic abundently present only in proteins of pulp while they are not found in seeds pronouncing the basicity of seed proteins.

Another interesting observation to be cited is the presence of certain amino acids in unhydrolyzed extracts of both seed and pulp but their absence in seed proteins. Like essential amino acids leucine and isoleucine, the proline and alanine, are also found in free form only.

The non protein amino acids as phosphoserine and taurine are expectedly present in unhydrolyzed extracts. Proline also behaves in a similar manner. The amino butyric acid and cystein are exclusive in amino acid composition of Falsa fruit as the former is only found in extract of free amino acids of seeds and the later that of pulp only. Phosphoserine, serine and taurine were found to be dominant acid in Falsa juice.

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