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CHANGES IN CORIANDER (*Coriandrum sativum* L.) LEAF JUICE DURING STORAGE WITH REFERENCE TO THE BIOCHEMICALS

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ABSTRACT

In India, leaves of coriander (*Coriandrum sativum* L.) are used frequently in curries. It is cultivated in almost all the states as an important subsidiary crop. The tender, stem, leaves and flowers of this crop have a pleasant aromatic odour and are the richest source of vitamin A and C. Attempts have been made during present investigation to point out biochemical changes associated with the storage of leaf juice upto 48 hours. Leaf juice was extracted from green foliages of Coriander (*Coriandrum sativum* L.) and stored for 48 hours. Studies on biochemical changes during storage revealed that the dry matter (DM), Ph, nitrogen (N) content and chlorophyll content in the juice gradually decreased and increase in the amount of lactic acid is observed when the juice was stored upto 48 hours.

Key Words: Coriander, Leaf Juice, Biochemical changes, Lactic Acid, Chlorophyll content.

Introduction:

Coriander (*Coriandrum sativum* L.) leaves was employed for extraction of leaf juice by mechanical fractionation. During mechanical fractionation as soon as the green foliage is harvested and pulped autolysis begins due to the activity of plant enzymes, which resemble the process of senescence (Singh, 1962, Batra et. Al., 1976; Mungikar and Joshi, 1976). The autolysis process leads to catabolism which involves breakdown of complex chemical compounds including protein. As a result of this the recovery of protein decreases with the decreases in the yield of leaf protein concentrate (LPC). To avoid this situation and to prevent nutrient losses, the delay between harvesting, pulping, pressing recovering the juice and heating is to prepare LPC should be avoided (Pirie, 1978). The leaf juice is prone to chemical change and its composition changes rapidly Nasi (1983). Proteolytic activity, chlorophyll breakdown anaerobic fermentation and microbial growth deteriorate the juice involving formation of lactic acid and decrease in the protein content (Chessman, 1977, Stewart and Houseman, 1977; Pirie, 1978). Singh (1962) observed that from 7 to 20 % of protein was autolysed due to the incubation of leaf extract for 2 hours at 37 ^{o} C. Enzymatically induced stability of protein in juice has been shown by several workers (Tracey, 1948; Macpherson, 1952; Brady, 1961; Batra et. al., 1976).

The overall results indicate that storage of leaf juice for few hours leads to depletion of nutrient and other organic compounds. Attempts have been made during present investigation to study changes in coriander (*coriandrum sativum* l.) leaf juice during storage with reference to the biochemical's.

Material and Methods:

Fresh leaves of Coriander (*Coriandrum sativum* L.) were obtained early in the morning from local vegetable market. Fresh leaves were immediately brought to the laboratory washed with water to remove the adhering soil particles. The leaves were crushed and pressed to release the leaf extract. The leaf juice released during pressing was employed for the experimental purpose. The samples of juice were stored at room temperature (23 to 36 ^{o}C) in conical flask plugged with cotton and the samples of stored juice were collected after every 04 hours till 48 hours of preservation.

The juice sample was dried in oven at 60 ± 05 o C till constant weight for the determination of dry matter (DM). The pH of the juice was measured using glass electrode on pH meter. Method of Barker and Summerson (1941), described by Oscer (1979) was employed for the estimation of lactic acid. The amount of chlorophyll, chlorophyll a and chlorophyll b were estimated following Yoshida et. al., (1976). Dry samples of leaf extracts were taken for the estimation of nitrogen (N). The nitrogen content was estimated following microKjaldhal method (Bailey, 1967). Statistical analysis of data is done by following (Mungikar, 1997) & Panse et. al., 1978).

Result Discussion:

Table 1: Biochemical changes associated with the storage of Corianderleaf juice.

Time of storage	% Dry matter (DM)	pH	Lactic Acid (% of DM)	Nitrogen (N) % of DM in Juice	Chlorophyll mg / ml			Chlorophyll a:b ratio
					Total	Chlorophyll- a	Chlorophyll- b	
00	3.04	5.8	-	3.16	0.28	0.15	0.12	1:0.80
04	2.98	5.7	-	3.09	0.27	0.14	0.12	1:0.85
04	2.93	5.7	-	3.00	0.26	0.14	0.11	1:0.78
12	2.88	5.7	-	2.86	0.25	0.13	0.11	1:0.84
16	2.82	5.6	-	2.75	0.23	0.13	0.10	1:0.76
20	2.76	5.6	0.10	2.62	0.22	0.12	0.09	1:0.75
24	2.71	5.6	0.17	2.54	0.21	0.12	0.09	1:0.75
28	2.66	5.5	0.24	2.50	0.20	0.11	0.08	1:0.72
32	2.60	5.5	0.38	2.47	0.19	0.11	0.08	1:0.72

36	2.54	5.5	0.55	2.45	0.18	0.10	0.07	1:0.70
40	2.49	5.4	0.69	2.43	0.17	0.10	0.06	1:0.66
44	2.43	5.4	0.75	2.41	0.16	0.09	0.06	1:0.60
48	2.38	5.4	0.75	2.38	0.15	0.09	0.05	1:0.55
Mean	2.70	6.0	0.45	2.66	0.21	0.11	0.08	1:0.72
S. D.	0.21	0.13	0.26	0.27	0.04	0.01	0.02	1:0.08
C. V.	7.77	2.32	57.6	10.1	19.0	9.09	25.0	0:12.1

The biochemical changes associated with the storage of Coriander (*Coriandrum sativum* L.) leaf juice are given in table 1. With the storage of juice the dry matter (DM) content was decreased from the initial value of 3.04 % to 2.38 % at the end of 48 hours due to the catabolic activity. With the decrease in dry matter (DM) pH also decreased from 5.8 to 5.4 at the end of 48 hours. Fermentation of leaf extract was speculated due to the formation of lactic acid during storage which was 0.75 % of DM of juice at the end of experiment. Such results were experienced and confirmed by earlier workers (Reddy and Mungikar, 1988b; Salve and Mungikar, 2009) is confirmed during this studies. The nitrogen content of dry matter (DM) in juice gradually decreased from 3.16 to 2.38 %. Minimum variation was experienced in % of dry matter (C. V. = 10.1). Large variation in lactic acid content was experienced (C. V. = 57.6 %). The chlorophyll content was also decreased during 48 hours while the chlorophyll a: b ratio remains almost unchanged and varied within the limits of 1: 0.80 to 1: 0.55.

The overall results presented in table 1 indicated the depletion of dry matter (DM), nitrogen (N), pH, chlorophyll and increase in the amount of lactic acid. The results also indicated that the nutrient content of fresh juice changes gradually.

Summary and conclusion:

The overall results showed that the dry matter (DM) content, nitrogen content, pH, total chlorophyll, chlorophyll-a, chlorophyll-b and chlorophyll-a: b ratio was decreased when the juice was stored upto 48 hours. In addition to this appearance of lactic acid in the juice and its gradual increase gives an indication of microbial activity in the form of fermentation.

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