



## PREPARATION OF FOOD PRODUCTS BY INCORPORATION OF DRIED COLOCASIA LEAVES POWDER

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### ABSTRACT

The present study deals with the preparation and palatability evaluation of recipes by using dried colocasia leaves powder. Three food products were prepared namely namakpara and sev. In this study control food products were prepared without adding colocasia leaves powder. Three variations were prepared with the addition of different proportions that is 3 g, 5 g, and 7 g. The products were prepared to assess its sensory characteristics that are appearance, colour, taste, texture and acceptability. Sensory evaluation was conducted using six human panelists coded as J1 to J6 and it was conducted in three trials in consecutive days. After palatability, raw scores were tabulated. The result of the study showed that the addition of dried colocasia leaves powder gave green colour to the product. Except namakpara, sev was highly accepted by the panel of judges. In the variation I, II and III of namakpara its appearance and colour showed significant difference ( $p < 0.001$ ). All the products were rich in all the nutrients specially proteins and calcium as compared with the control. The dried colocasia leaves are rich in all the nutrients as compared with the fresh colocasia leaves.

**Keywords:** Colocasia leaves, Nutrients, Palatability evaluation

### Introduction

Green leafy vegetable occupy an important place among the food crops as these provide adequate amounts of many vitamins and minerals for humans. In nature, there are many underutilized greens of promising nutritive value, which can nourish the ever increasing

human population. Many of them are resilient, adaptive and tolerant to adverse climatic conditions. Now a day, underutilized foods are gaining importance as a means to increase the per capita availability of foods. Since low consumption of green leafy vegetables in diet is one of the major factors, which leads to



the deficiency of vitamin A and iron (Joshi P. et al, 2010).

The leafy vegetables are highly perishable and therefore they have very less shelf life. Nutritional losses occur due to post harvest handling, transportation, processing and storage. Many of the local vegetables are under exploited because of inadequate scientific knowledge of their nutritional potentials. Preservation of these green leafy vegetables can prevent huge wastage as well as making them available in the lean season. Among various methods of preservation, dehydration of vegetables is one of the most popular and oldest methods. Dehydration increases the storage period of green leafy vegetables and make them available throughout the year even in off season, thus supplying the important nutrients in a concentrated form (Singh L. et al, 2006).

Thus keeping in mind all these factors the present study was undertaken to explore the

possibilities of using dehydrated colocasia leaves in different recipes.

Colocasia is thought to be the oldest cultivated plant in the world, having been cultivated in Asia for more than ten thousand years. *Colocasia esculenta* is herbaceous perennial plant belonging to the *Araceae* family. The leaves are also used as leafy vegetables. Fresh leaves reported to be rich in protein, ascorbic acid, dietary fibre and some nutritionally important minerals (Nakade D. et al 2013).

### **Methodology**

Fresh sample of colocasia leaves were procured from the local market of Nagpur city. Healthy leaves were sorted after cleaning and washing under tap water. Leaves were chopped in a desired size and placed on cotton cloth and were dried in a direct sunlight for 3-4 days till they turned crisp. The leaves were then turned to homogeneous powders in mixer grinder.

Products namely namakpara and sev were developed by



incorporating dehydrated colocasia leaves powder. Incorporation level of this powder in the food products was 3 g, 5 g and 7 g. Control products was also prepared without addition of this powder. The nutritive value of these products was calculated (Gopalan C., 2007). Palatability evaluation of the products was done by six judges (JI –J6) by sensory parameters like appearance, colour, taste, texture and appearance. Scores were given by the judges to each product. These scores of sensory evaluation were collected and tabulated and to see the significant difference among different variations student “t” test was used.

## Results and Discussion

### Namakpara

As the dried colocasia leaves powder is green in colour it gave a green colour to the food which was light in colour at the lower levels (3 g), which increased to darker shades of green with the increased levels of the powder (5 g & 7 g) in variation I & II. Addition of this powder did not

change the taste to a great extent. Scores from the **table 1** showed the 100 % acceptability of the product namakpara. The result of the student “t” test (control & variation I) showed the significant difference at 5 % level and 1 % level ( $0.01 < p < 0.05$ ) for appearance while for rest of the parameters it showed insignificant difference at both the levels ( $p > 0.05$ ). **Table 2** showed the result of the student “t” test (control & variation II) showed the significant difference for appearance and colour at both the levels ( $p < 0.01$ ) while taste and acceptability showed significant difference at 5 % level but insignificant difference at 1 % level ( $0.01 < p < 0.05$ ) and for texture it showed insignificant difference at both the levels ( $p > 0.05$ ). **Table 3** observed the higher amount of dried colocasia leaves powder in this variation of namakpara affects all the sensory parameters. Because of its dull and dark green colour its appearance was not pleasing. Its texture was very oily because of its powdery content so its score was



less. Its taste also affects. This variation was not acceptable by the maximum judges. The result of the student “t” test (control & variation III) showed the insignificant difference in texture ( $p > 0.05$ ). Appearance and colour showed significant difference at 5 % and 1 % level ( $p < 0.01$ ) while taste and acceptability showed significant difference at 5 % but insignificant difference at 1 % level ( $0.01 < p < 0.05$ ).

### Sev

**Table 4** observed very slight differences in the palatability scores of sev (control & variation I). The result of student “t” test showed insignificant difference in each parameter ( $p > 0.05$ ). **Table 5** indicates that variation II of sev was liked by maximum judges than the variation II of namakpara when the cooking method of deep frying was same for both the products. The result of the student “t” test showed that in colour there is a significant differences was observed at 5 % level and insignificant differences at

1 % ( $0.01 < p < 0.05$ ). All the other parameters showed insignificant difference at both the level ( $p > 0.05$ ). **Table 6** showed the result of the student “t” test that in appearance and acceptability there is a significant differences was observed at 5 % and 1 % ( $p < 0.01$ ). Colour showed the significant difference at 5 % and level and insignificant differences at 1 % ( $0.01 < p < 0.05$ ) and taste and texture showed insignificant difference at both the levels ( $p > 0.05$ ).

### Nutritive Value

Micro and macro nutrient content of namakpara and sev were calculated (Gopalan C. 2007). **Table 7** showed that all the variation I and II of namakpara and sev are rich in energy, carbohydrate, protein, fat, iron, calcium, phosphorus, sodium, potassium, fiber than control. In comparison with all its variations of both the products they absorbed more oil because of the addition of dried colocasia powder so the energy and fat content increased. The iron content of black variety of fresh



colocasia leaves is 0.98 mg (Gopalan C. et al, 2007) but there is no iron in the dried colocasia leaves powder. It is concluded from the study that dried green leafy vegetables can be a

good option in the period when these are not available seasonally. Utilization of these powders in variety of dishes will improve the nutrient intake of the population.

**Table 1: Mean palatability Scores of Control and Variation I for Namakpara**

Sr. No.	Sensory Parameters	Control	Variation I	Student "t" test
1.	Appearance	10	9.5	2.27**
2.	Colour	9.8	10	1.81
3.	Taste	9.8	9.7	0.41
4.	Texture	9.7	9.6	0.38
5.	Acceptability	9.8	9.8	0

\*\*values indicate significant difference at 5 % but insignificant at 1 % level ( $0.01 < p < 0.05$ ). Rest of the values indicates insignificant difference at both 5 % and 1 % levels ( $p > 0.05$ ).

**Table 2: Mean palatability Scores of Control and Variation II for Namakpara**

Sr. No.	Sensory Parameters	Control	Variation I	Student "t" test
1.	Appearance	10	8.8	3.87**
2.	Colour	9.8	8.8	4.16*
3.	Taste	9.8	8.9	2.36**
4.	Texture	9.7	9.3	0.97
5.	Acceptability	9.8	8.9	2.36**

\*values indicate significant difference at 5 % and 1 % level ( $p < 0.01$ ).

\*\*values indicate significant difference at 5 % but insignificant at 1 % level ( $0.01 < p < 0.05$ ). Rest of the values indicates insignificant difference at both 5 % and 1 % levels ( $p > 0.05$ ).

**Table 3: Mean palatability Scores of Control and Variation III for Namakpara**

Sr. No.	Sensory Parameters	Control	Variation I	Student "t" test
1.	Appearance	10	8.1	3.33*
2.	Colour	9.8	7.9	7.91*
3.	Taste	9.8	8.3	2.23**
4.	Texture	9.7	8.8	1.63
5.	Acceptability	9.8	8.3	2.63**

\*values indicate significant difference at 5 % and 1 % level ( $p < 0.01$ ).

\*\*values indicate significant difference at 5 % but insignificant at 1 % level ( $0.01 < p < 0.05$ ).

Rest of the values indicates insignificant difference at both 5 % and 1 % levels ( $p > 0.05$ ).

**Table 4: Mean palatability Scores of Control and Variation I for Sev**

Sr. No.	Sensory Parameters	Control	Variation I	Student "t" test
1.	Appearance	10	10	00
2.	Colour	10	9.8	2
3.	Taste	9.7	9.8	0.41
4.	Texture	9.7	9.7	00
5.	Acceptability	9.8	9.8	00

All the values indicates insignificant difference at both 5 % and 1 % levels ( $p > 0.05$ ).

**Table 5: Mean palatability Scores of Control and Variation II for Sev**

Sr. No.	Sensory Parameters	Control	Variation I	Student "t" test
1.	Appearance	10	9.7	0.93
2.	Colour	10	9.2	2.58**
3.	Taste	9.7	9.6	0.32
4.	Texture	9.7	9.5	0.76
5.	Acceptability	9.8	9.5	1.25

\*\*values indicate significant difference at 5 % but insignificant at 1 % level ( $0.01 < p < 0.05$ ).

Rest of the values indicates insignificant difference at both 5 % and 1 % levels ( $p > 0.05$ ).

**Table 6: Mean palatability Scores of Control and Variation III for Sev**

Sr. No.	Sensory Parameters	Control	Variation I	Student "t" test
1.	Appearance	10	9.7	0.93
2.	Colour	10	9.2	2.58**
3.	Taste	9.7	9.6	0.32
4.	Texture	9.7	9.5	0.76
5.	Acceptability	9.8	9.5	1.25

\*\*values indicate significant difference at 5 % but insignificant at 1 % level ( $0.01 < p < 0.05$ ). Rest of the values indicates insignificant difference at both 5 % and 1 % levels ( $p > 0.05$ ).

**Table 7: Mean Nutritive Value of Namakpara and Sev**

Sr. No.	Name of the Product	Parameters	Energy (kcal)	Carbohydrate (g)	Protein (g)	Fat (g)	Iron (mg)	Crude Fiber (mg)	Calcium (mg)	Phosphorus (mg)	Na (mg)	K (mg)
1.	Namakpara	Control	572.5	46.9	7.43	40.37	5.43	0.79	32.8	106.3	27.9	84.9
		Variation I	580.8	48.21	7.54	40.72	5.43	1.27	79.2	115.5	27.9	84.9
		Variation II	613.3	48.88	8.12	43.66	5.43	1.59	110	121	27.9	84.9
		Variation III	672.8	49.90	8.39	49.78	5.43	1.91	141	127.9	27.9	84.9
2.	Sev	Control	516.35	36.34	12.74	35.60	3.28	1.07	39.92	204.7	45.17	59.44
		Variation I	524.66	37.61	13.15	35.78	3.28	1.55	86.3	213.9	45.17	59.44
		Variation II	584.2	38.45	13.74	41.90	3.28	1.87	117.2	220.1	45.17	59.44
		Variation III	625.2	39.30	13.7	46.02	3.28	2.19	1481	226.2	45.17	59.44

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