



ISSN (E): 2277-7695  
ISSN (P): 2349-8242  
NAAS Rating: 5.23  
TPI 2022; 11(12): 6205-6208  
© 2022 TPI  
[www.thepharmajournal.com](http://www.thepharmajournal.com)  
Received: 05-09-2022  
Accepted: 08-10-2022

#### Mundhe SS

Ph.D. Scholar, Department of  
FBM, College of Food  
Technology, VNMKV, Parbhani,  
Maharashtra, India

#### More DR

Associate Professor, Department  
of FBM, College of Food  
Technology, VNMKV, Parbhani,  
Maharashtra, India

#### Shinde EM

Ph.D. Scholar, Department of  
FBM, College of Food  
Technology, VNMKV, Parbhani,  
Maharashtra, India

## Studies on sensory evaluation of mathari incorporated with vegetable powders

Mundhe SS, More DR and Shinde EM

### Abstract

The present research work was done to study sensory evaluation of mathari incorporated with vegetable powders such as Ghol (*Portulaca oleracea*) and Chandan bathua (*Chenopodium album*). Wild vegetables play an essential role in food supplies as they have sufficient level of nutrients, vitamins, minerals and possess good antioxidant properties which improve the human health. So, incorporation of these vegetable powders in mathari will be beneficial for human health. Leaves were pretreated with blanching treatment and then dried by cabinet drying method. Dried leaves were ground into the powder. Vegetable powders were incorporated into mathari at 3%, 6% and 9% level. Sensory evaluation of mathari was done to check maximum level of incorporation of vegetable powder in mathari without affecting the sensory qualities. It was found that mathari incorporated with 6% vegetable powder was found highly acceptable by recording highest scores in all sensory attributes.

**Keywords:** Wild vegetables, ghol, Chandan bathua, mathari and sensory evaluation

### 1. Introduction

The wild edible vegetables are essentially important in the biochemical and nutritional aspects as they are the best sources of proteins, amino acids, carbohydrates, fibre, vitamins, minerals and bioactive compounds which are very important for health and play an active roles in prevention of many diseases like cancer, diabetes, coronary heart diseases, etc. (Saikia & Deka, 2013) [8]. Hence, these wild edible plants can be integrated into the normal diet to achieve daily requirements of important nutrients from food. There are many therapeutic uses of wild vegetables in case of eye, stomach, kidney diseases, dysentery, toothache, piles, haemorrhoid, dizziness, anemia, joint pain, ear and skin diseases. (Naik *et al.*, 2017) [5].

Vegetables are perishable commodities with very high moisture contents; therefore, dehydration results in substantial reduction in weight and bulk with consequent savings in storage costs. (Kamela *et al.*, 2016) [3]. Dried vegetables are more concentrated than any other preserved form of foodstuffs and are tasty, nutritious, lightweight and easy to prepare, store and use (Mehmet *et al.*, 2011) [4]. In the food processing industry the heat treatment of vegetables is a very important operation. The objective is to produce dried food that is shelf-stable, and microbiologically safe, with minimal degradation of nutrients and sensory properties.

A snack food refer to sweet, spicy or salty, ready to eat foods and generally includes the items such as chips/crisps, extruded snacks, mathari, namakpare, chocolate, confectionery, Biscuits, etc. Snacks are defined as a "quick small meals" between regular meals. Snack meals have become an important substitution for traditional meals. Traditionally, snacks were prepared at the home level from commonly available ingredients. It has been found to be more convenient to prepare snack which at least partially meet the nutritional needs. Plain snacks like plain cereals, pasta and vegetables are very popular. Snack foods are typically designed to be portable, quick and satisfying. Mathari is a ready to eat snack generally made by the addition of refined wheat flour, ajwain, salt, refined oil, lukewarm water. It is served best with a hot beverage and is popular Indian snack. Mathari is a popular north Indian snack. This deep fried snack is perfect for tea-time munching.

### 2. Material and Methods

#### 2.1 Material

##### 2.1.1 Raw material

The green colored matured underutilized wild vegetables i.e. Ghol (*Portulaca oleracea*), Chandan Bathua (*Chenopodium album*), refined wheat flour, ajwain, salt and oil were collected from local market of Parbhani, Maharashtra.

#### Corresponding Author:

##### Mundhe SS

Ph.D. Scholar, Department of  
FBM, College of Food  
Technology, VNMKV, Parbhani,  
Maharashtra, India

## 2.2 Methods

### 2.2.1 Preparation of vegetable powder

The wild vegetable leaves were sorted, washed with distilled water and spread on muslin cloth then placed in blanching solutions for 3 minutes followed by dipping in cold water to stop further processing. The blanching treatment 0.5% sodium metabisulphite was followed for blanching of leaves prior to

drying. Then these blanched leaves were dried by cabinet drying techniques. Later the dried materials were milled in a powder with mixer cum grinder, sieved through a 0.4 mm wire mesh and stored in air tight container at room temperature (Stevell & Babatunde, 2013) [11].

### 2.2.2 Standardized recipe for preparation of mathari

**Table 1:** Standardized recipe for preparation of mathari

Ingredients	Quantity
Maida	100 g
Salt	3.5 g
Ajwain	1.5 g
Oil	20 ml
Water	60 ml
Oil (for frying)	40 ml

### 2.2.3 Procedure for preparation of mathari incorporated with vegetable powders

Mathari is a refined wheat flour based deep fat fried product, which is generally eaten as a snack. Refined wheat flour (100 g) was taken and sieved with mesh. Then constant amount of salt (3.5 g) and ajwain (1.5 g) were added in the flour. After that vegetable powders in the ratio of 3%, 6% and 9% were added. Oil (20 ml) was added in the flour and mixed properly. Then water (60 ml) was added and kneaded well to make stiff dough. The dough was kept a side for 10 minutes, kneaded again and divided into small portions. Then rolled and cut in to round shape. Mathari was deep fried in oil (40 ml) for 5 minutes until they were golden brown in colour. The recipe and procedure used were as per given by Kadhbhane *et al.*, (2019) [2] along with some modifications. The procedure for preparation of mathari incorporated with vegetable powders was illustrated in flow sheet 1.

### 2.2.4 Organoleptic evaluation of prepared value added food products

Samples of prepared value added food products have been analyzed by a semi-trained panel of 10 judges for their organoleptic qualities including appearance, color, taste, flavor, texture and overall acceptability by applying a 9-point Hedonic rating scale (Amarine *et al.*, 1987) [1].

### 2.2.5 Statistical analysis

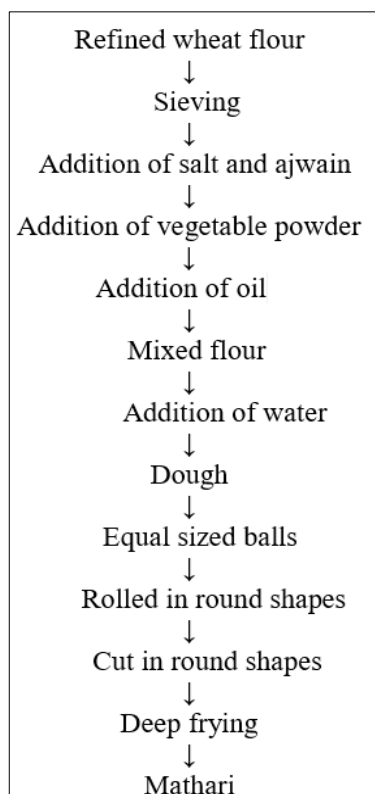
The analysis of variance of the data obtained was done by using Completely Randomized Design (CRD) for different treatments as per the methods given by (Panse and Sukhatme, 1984) [6]. The analysis of variance revealed at significance of  $p < 0.05$  level, S.E. and C.D. at 5% level were mentioned wherever required.

## 3. Results and Discussion

**Table 2:** Proximate composition of fresh wild vegetables (Per cent)

Wild Vegetables	Moisture	Fat	Protein	Carbohydrate	Ash	Fiber
Ghol	89.00	0.24	2.94	5.00	1.62	1.04
Chandan bathua	86.72	0.53	3.45	5.56	1.88	1.06
SE±	1.061	0.020	0.026	0.109	0.023	0.106
CD at 5%	3.198	0.066	0.080	0.328	0.072	0.321

The data obtained from table 2 showed the proximate composition of wild vegetables. The moisture content of ghol leaves (89.00%) was higher than chandan bathua (86.72%). Chandan bathua leaves were having higher amount of fat (0.53%), protein (3.45%), carbohydrate (5.56%), ash (1.88%) and fiber (1.06%) than ghol leaves which were having fat (0.24%), protein (2.94%), carbohydrate (5.00%), ash (1.62%) and fiber (1.04%). The ash is an inorganic content which gets after complete burning of any food commodity. The ash content gives the mineral content of the food products. The similar results of proximate composition of ghol were obtained by research findings of Petropoulos *et al.*, (2019). It was found that results of proximate composition of chandan bathua were similar to Saini & Saini, (2020) [9].



**Flow sheet 1:** Preparation of mathari incorporated with vegetable powder

**Table 3:** Sensory evaluation of mathari incorporated with Ghol powder

Sample Code	Appearance	Color	Taste	Flavor	Texture	Overall Acceptability
C	8.4	7.5	7.3	7.5	8.0	7.74
G1	7.2	7.2	7.6	7.7	8.2	7.58
G2	8.8	8.5	8.4	8.2	8.7	8.52
G3	6.5	6.0	7.0	7.2	6.7	6.68
SE±	0.120	0.147	0.256	0.347	0.179	0.173
CD at 5%	0.256	0.431	0.748	1.012	0.523	0.514

Where,

C: Control Sample.

G1: Mathari with 97% maida and 3% ghol powder.

G2: Mathari with 94% maida and 6% ghol powder.

G3: Mathari with 91% maida and 9% ghol powder.

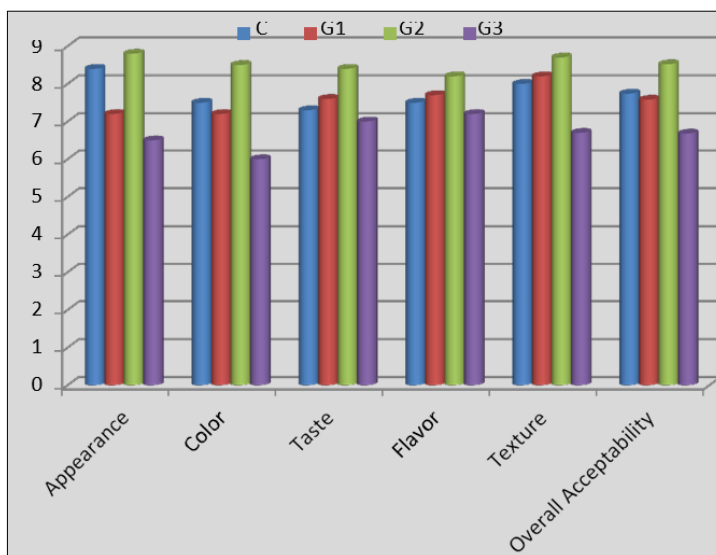
The data presented in table 3 depict the sensory evaluation of mathari incorporated with Ghol powder. Highest score for the appearance was observed for G2 (8.8) followed by control,

G1 and G3. The highest score of the color was observed for G2 (8.5) followed by control, G1 and G3. Highest score for taste, flavor and texture was observed in G2 followed by G1, control and G3. The overall acceptability was found highest in G2 (8.52) followed by control (7.74), G1 (7.58) and G3 (6.68). The score of G2 was found significant over control, G1 and G3 with respect to appearance, color, taste, flavor and texture and overall acceptability. It was evident from the table that mathari sample prepared with 6% ghol powder was highly acceptable by the panelists by recording highest scores in all sensory attributes. Mathari prepared with 9% ghol powder recorded the lowest scores in all sensory attributes. Sensory parameters were affected due to color, taste, flavor and texture given by ghol powder.

Similar results were found by Sharma & Prasad, (2018) [10] who incorporated dehydrated cauliflower stem powder in mathari at 5 g, 10 g & 15 g respectively. The overall acceptability of sample incorporated with 5 g powder was significantly better than control.



**Plate 1:** Mathari incorporated with Ghol powder



**Fig 1:** Sensory evaluation of mathari incorporated with Ghol powder.

**Table 4:** Sensory evaluation of mathari incorporated with Chandan bathua powder

Sample Code	Appearance	Color	Taste	Flavor	Texture	Overall Acceptability
C	8.3	7.8	7.5	7.6	8.2	7.88
C1	7.7	7.0	7.8	7.8	8.4	7.74
C2	8.6	8.0	8.9	8.7	8.8	8.60
C3	7.0	6.5	6.8	6.6	7.0	6.78
SE±	0.209	0.056	0.076	0.101	0.189	0.183
CD at 5%	0.629	0.170	0.231	0.304	0.571	0.554

Where,

C: Control Sample.

C1: Mathari with 97% maida and 3% chandan bathua powder.

C2: Mathari with 94% maida and 6% chandan bathua powder.

C3: Mathari with 91% maida and 9% chandan bathua powder.

The data presented in table 4 depict the sensory evaluation of mathari incorporated with chandan bathua powder. It was evident from the table that highest score for appearance was observed for C2 (8.6) and lowest in C3 (7.0). The score for the color was highest in C2 (8.0) which was statistically significant over C1 and C3. The sample C2 was significant over control, C1 and C3 with respect to taste, flavor, texture and overall acceptability. The highest score for overall acceptability was recorded in C2 sample (8.60) followed by control (7.88), C1 (7.74) and C3 (6.78). It was clear from the table that mathari sample prepared with 6% chandan bathua powder was highly acceptable by the panelists by recording highest scores in all sensory attributes. Mathari prepared with 9% chandan bathua powder recorded the lowest scores in all sensory attributes. Sensory parameters were affected due to color, taste, flavor and texture given by chandan bathua powder.

Similar findings were observed by Verma & Jain, (2012) [12] who added powder of green leafy vegetables (spinach, mint, carrot and lotus stem) in mathari at 7%.



Plate 2: Mathari incorporated with Chandan bathua powder

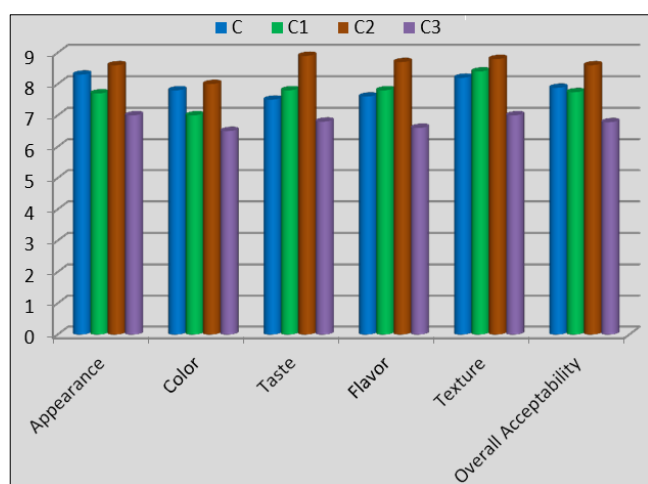


Fig 2: Sensory evaluation of mathari incorporated with Chandan bathua powder

#### 4. Conclusion

On the basis of the present investigation, it may be concluded that mathari can be prepared with incorporation of vegetable powder up to the level of 6% by recording highest scores in all sensory attributes. The overall acceptability of sample incorporated with 6% powder was significantly better than

control. Mathari incorporated with vegetable powders may be a good source of nutrients and it can be incorporated in the daily diet.

#### 5. References

1. Amarine MA, Pangborn RM, Roessler EB. Principle of sensory evaluation of food. Academic Press. New York, USA; c1987.
2. Kadbhane VS, Shelke GN, Giram KK. Preparation of Tandulaja powder and its fortified Mathari. Journal of Pharmacognosy and Phytochemistry. 2019;8(3):4553-4557.
3. Kamela A, Mouokeu R, Rawson A, Tazoho G, Moh L, Tedonkeng E, *et al.* Influence of Processing Methods on Proximate Composition and Dieting of Two *Amaranthus* Species from West Cameroon. International Journal of Food Science; c2016. p. 1-8.
4. Mehmet O, Arzu A, Tulay O, Lutfiye Y. Effect of Dehydration on Several Physico-Chemical Properties and the Antioxidant Activity of Leeks (*Allium porrum* L.). Notulae Botanicae Horti Agrobotanic Cluj-Napoc. 2011;39(1):144-151.
5. Naik R, Borkar S, Bhat S, Acharya R. Therapeutic potential of wild edible vegetables - A Review. Journal of Ayurveda and Integrated Medical Sciences. 2017;2(6):85- 97.
6. Panse V, Sukhatme P. In: Statistical methods for agricultural workers. ICAR publication second edition; c1984.
7. Petropoulos S, Fernandes A, Dias M, Vasilakoglou I, Petrotos K, Barros L, *et al.* Nutritional value, chemical composition and cytotoxic properties of common Purslane (*Portulaca oleracea* L.) in relation to harvesting stage and plant part. Antioxidants. 2019;8(293):1-15.
8. Saikia P, Deka D. Mineral content of some wild green leafy vegetables of North-East India. Journal of Chemical & Pharmaceutical Research. 2013;5(3):117-121.
9. Saini S, Saini K. *Chenopodium album* Linn. An outlook on weed cum nutritional vegetable along with medicinal properties. Life Sciences Research. 2020;6(1):28-33.
10. Sharma R, Prasad R. Nutritional evaluation of dehydrated stems powder of cauliflower incorporated in mathri and sev. Journal of Nutrition and Food Sciences. 2018;8(1):1-3.
11. Stevel IO, Babatunde OI. Chemical compositions and nutritional properties of popcorn-based complementary foods supplemented with Moringa oleifera leaves Flour. Journal of Food Research. 2013;2(6):117-132.
12. Verma S, Jain S. Fortification of mathri with fresh and dehydrated vegetables and assessment of nutritional quality. Rajasthan Journal of Extension and Education. 2012;20:155-158.