



## Nutritional And Phenolic Composition of Fresh And Dried Bitterguord - Peel, Seed And Pulp

### KEYWORDS

Bitterguord, phenolic compound, drying, total antioxidant capacity

**Gayatree Jadeja**

Krushvi Vigyan Kendra, Anand Agricultural University, Arnej - 382230, Gujarat

**ABSTRACT** Bitterguord is a popular vegetable in Asia and is used to prepare several dishes. They are highly nutritive and are relatively high in proteins, minerals and vitamins. Bitter guord has already been reported as a good source of phenolic compounds, which possessed potent antioxidant activity. The present study was planned to fulfil the objectives like nutritional assessment of fresh and oven dried bitterguord and its parts i.e. peel, seed and pulp. The Moisture, Ash, Iron, Calcium, Phosphorus, Total phenol, Flavanoid and Total antioxidant capacity were analysed from the bitterguord samples. The nutritional results suggested that moisture content were found higher in the pulp compared to whole fresh bitterguord. The ash, calcium, phosphorus and iron contents were higher in seed compared to the other parts of the fresh and dried bitterguord. Total phenol content of the fresh seed and dried pulp were found higher compared to the whole fresh and dried bitterguord. Total antioxidant capacity content of fresh pulp was higher compared to whole fresh bitterguord. The study suggested that the bitterguord fresh and dried seeds were nutritionally better than the whole bitterguord.

### Introduction:

Bitter melon or bitterguord is the English name of *Momordica charantia*. It is also known by the name of Karela in Hindi and Karevellalw, Andravelli in Sanskrit (Kumar et al., 2010). It is a green cucumber shaped fruit with guard like bumps all over it. It looks like ugly, light green cucumber. The fruit is firm and its taste is very bitter. Although the seed, leaves and vines of bittermelon have been used. The fruit is the safest and most prevalent part of the plant used medicinally (Aminah and Anna, 2011).

Bitterguord is a common food in Indian cuisine and is also used as a medicine. The leaves and fruit of bitterguord have been used in folk medicine traditions of China, India, Africa and in West Indies since ancient times. Bitterguord has important role as a source of carbohydrates, proteins, vitamins, minerals and other nutrients in human diet (Ali et al., 2008). Bitterguord being rich in all essential vitamins and minerals, especially Vitamin A, B<sub>1</sub>, B<sub>2</sub>, C and Iron contents. Its regular use prevents many complications, neuritis and defective metabolism of carbohydrates. It increases body's resistance against infection (Tanuja and Saxena, 2012). Bitterguord has already been reported as a good source of phenolic compound, which possessed potent antioxidant activity (Aminah and Anna, 2011). Bitterguord not only possesses important nutritional constituents but also contains several other chemical constituents which offer an array of medicinal activities (Trivedi et al., 2011). Bitterguord has natural benefits and curative properties. It is antitodal, antipyretic, appetizing, stomachic, antibilious and laxative.

### Materials and Methods:

In the present study the fresh sample of bitterguord parts as peel, seed and pulp were separated and then dried using the oven drying technique. After drying they were powdered and then the fresh and the dried powder of bitterguord parts (peel, seed, pulp and whole) were used for the nutritional analysis for moisture (AOAC, 1984), ash (AOAC, 1984), iron (Ramsay, 1954), calcium (Clark and Collips, 1925), phosphorus (Fiske and Subbarao, 1925), total phenol (Hagerman and Makker, 2000), flavanoid (Lamelson and Carnet, 1990) and total antioxidant capacity (Macule, 2000).

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### Results and Discussion:

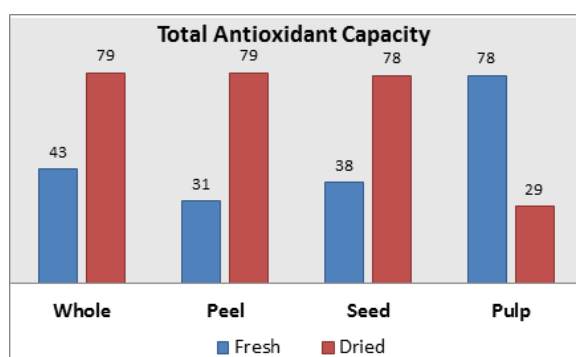
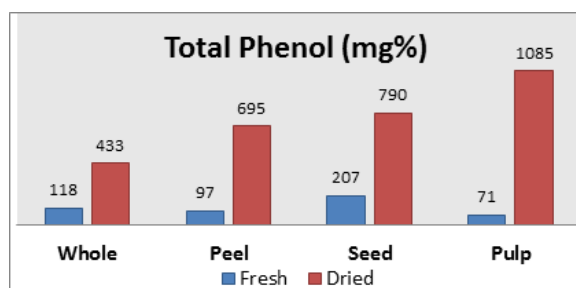
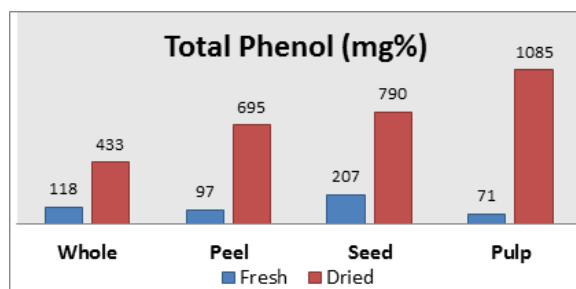
Bittermelon is used for some medicinal purposes in traditional medicine the fresh and dried bitterguord were analysed for the moisture, ash, iron, calcium and phosphorus content using the standard analytical methods. The results shown in table 1 suggested that the moisture content of fresh bitterguord pulp was higher in amount compared to whole bitterguord and peel and seed of the fresh bitterguord as it should be. Obviously the dried bitterguord powder was not analyzed for the moisture content as it is free from moisture. The ash content of the fresh and dried bitterguord seed were higher compared to the other parts of bitterguord. It indicated that the seed has higher amount of minerals compared to the seed, pulp and whole bitterguord. The iron, calcium and phosphorus were found higher in both the fresh and dried bitterguord seed compared to the bitterguord peel, pulp and the whole fruit. In comparison of fresh and dried sample the iron and calcium contents were increased up to two to three times after drying whereas the phosphorus contents were slightly increased after drying. The study indicates that the presence of nutritional components that are beneficial in addition to the purported numerous medicinal values of the bittermelon plant (Bakare et al., 2010).

**Table 1: Moisture, Ash, Iron, Calcium and Phosphorus content of fresh and dried bitterguord**

Nutrients	Bitterguord			
	Whole	Peel	Seed	Pulp
Moisture (gm%)				
Fresh	16.67 ± 0.66	14.67 ± 1.66	13.67 ± 1.86	53.67 ± 0.33
Ash (gm%)				
Fresh	1.50 ± 0.50	2.17 ± 0.60	4.83 ± 2.62	1.00 ± 0.87
Dried	9.33 ± 2.17	4.17 ± 0.44	10.17 ± 2.30	5.50 ± 0.58
Iron (mg%)				
Fresh	5.99 ± 0.24	5.32 ± 0.21	10.45 ± 0.31	8.71 ± 0.21
Dried	20.19 ± 0.26	17.78 ± 0.42	21.68 ± 0.29	21.39 ± 0.20

Calcium (mg%)				
Fresh	47.22 ±6.69	52.78 ±2.78	175.00 ±5.69	163.88 ± 5.12
Dried	188.88 ±8.24	113.89 ± 6.69	241.67 ±5.69	219.44 ± 5.12
Phosphorus (mg%)				
Fresh	38.09 ±0.05	60.28 ±0.16	65.77 ±0.23	51.16 ± 0.10
Dried	79.51 ±0.39	79.51 ±0.18	106.51 ±0.10	88.37 ±0.16

Mean of 3 replication ± SEM



**Figure 1: Total phenol, Flavanoid and Total antioxidant capacity of fresh and dried bitterguord**

In present study, we had carried out phenol, Flavanoid and total antioxidant capacity of fresh and dried bitterguord. Figure 1 depicted the total phenol, Flavanoid and the total antioxidant capacity of the fresh and dried bitterguord. The results indicated that the dried pulp of bitterguord contained the highest amount of total phenol compared to the seed, peel and the whole fresh and dried bitterguord. As far as the Flavanoid content were concerned it was increased in all samples after drying and the whole bitterguord and peel and pulp of the dried bitterguord contained almost the same amount of Flavanoid content. In the fresh samples the Flavanoid was found in very less amount. The findings of Amirah et al (2013), suggested that bitterguord is a good source of bioactive compounds and in his study it was observed that there was a significantly increased in plasma total antioxidant capacity in rat

after the consumption of bittermelon. In our study we had found that the whole bitterguord and the seed and peel of the bitterguord increased the total antioxidant capacity after the drying process.

#### Conclusion:

We can conclude the present study as the fresh and dried bitterguord seeds were nutritionally beneficial and it also contained the higher phenol and antioxidant capacity. So we can use the bitterguord seed for medicinal purpose as it is beneficial for the health.

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