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ORIGINAL PAPER



Bottle gourd: Nutritional benefits and Value added products

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Vegetable plays an important role in daily human diet. 'Thy food be thy medicine' is one of the laws of nature. A joint initiative to encourage fruits and vegetables worldwide for better health was launched by WHO and FAO. Vegetable consumption is associated with protection against certain health related risk like cancer, cardiovascular disease and numerous age related diseases. They act as crucial source of salts, vitamins and minerals which are necessary for providing nourishment to human body. Although numerous vegetables are cultivated in India but bottle gourd (*Langenaria siceraria*) has its specific importance as it is rich and cheaper source of nutrients. It is native to African but approx 9000 years ago it was introduced in Asia and America most likely as a wild species. In India bottle gourd is popularly called as *Doodhi*, *Ghia*, *Kaddu* and *Lauki*, it is absolutely not getting all attention it deserves. Complex compound such as, cucurbitacins are found in plants belonging to Cucurbitaceae family. In Asia, bottle gourd is considered as an essential component of indigenous herbal medicine. *L. siceraria* is a useful domesticated cucurbit with an ancient pantropical (all tropics) distribution.

SCIENTIFIC CLASSIFICATION

Order : Cucurbitales

Family : Cucurbitaceae

Genus : *Langenaria*

Species : *siceraria*

Botanical name : *Langenaria siceraria*

NUTRITIONAL COMPOSITION

Bottle gourd is very health and easily available vegetable. It is composed of 96.1% moisture, 0.1% fat, 0.5% minerals, 0.6% fiber, 2.5% carbohydrates, 12 kcal energy, 0.7 mg/100g iron, 0.03 mg/100g thiamine, 0.2 mg/100g niacin and 0.01 mg/100g riboflavin (Srivastiva *et al.*, 2002). It is a good source of antioxidant and phenols. It also contains 10.10 mg/100g ascorbic acid, 5.80 g/100g total sugar, 5.22 g/100g reducing sugar and 1.31 g/100g starch (Milind and Satbir, 2011).

Parameters	Bottle gourd
Moisture	96.1%
Total sugar	5.80 g/100g
Reducing sugar	5.22 g/100g
Carbohydrates	2.5%
Fiber	0.6%
Fat	0.1%
Energy	12 kcal
Minerals	0.5%

HEALTH BENEFITS

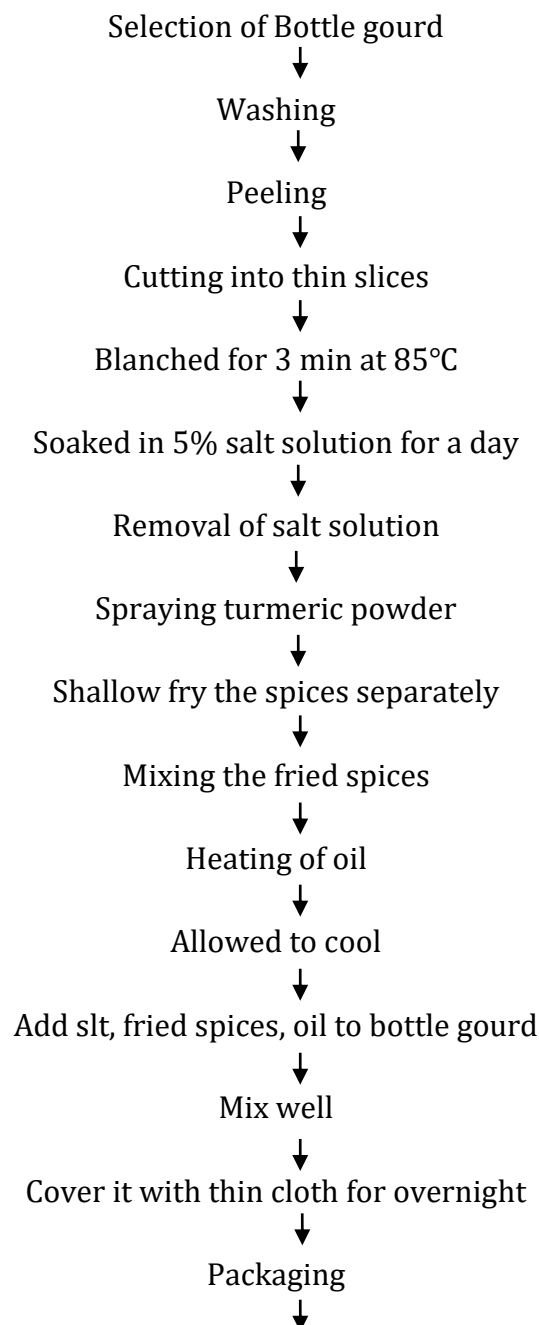
- Bottle gourd has high percent of water thus don't let human body to dehydrate, it is a rich source of calcium and vitamins (C and K), shows cooling effect on human body and even act as a good laxative.
- Provide relief to patients affected by heart problems, urinary disorders and insomnia. It is also suggested for its properties like anti-diabetic and aphrodisiac.
- Bottle gourd pulp is helpful in overcoming cough, night blindness, constipation and also acts as antidote against certain poisons. Its pulp is a suitable substitute for people suffering from lactose intolerance.
- Useful in managing many diseases like cardiac disorders, hepatic diseases and ulcer. Its high potassium content manages blood pressure of hypertensive patients.
- Helpful in losing weight quickly because it is low in fat and cholesterol and provides high dietary fiber.
- Bottle gourd contains high level of choline which acts as healer for disorders related to mental health.

VALUE ADDED PRODUCTS OF BOTTLE GOURD

Numerous value added products can be developed from bottle gourd for instance, pickle, raita, halwa, laddu, burfi, juice, nectar, sweetmeat, tutti-fruity, kheer, pedha etc. These bottle gourd products are quite healthy and highly nutritious.

- 1. Bottle Gourd Pickle:** Pickling is a traditional method of food preservation. Pickle developed from bottle gourd increases shelf life of this vegetable. By using different spices like turmeric, mustard, clove and asafetida, pickle can be made more delicious.

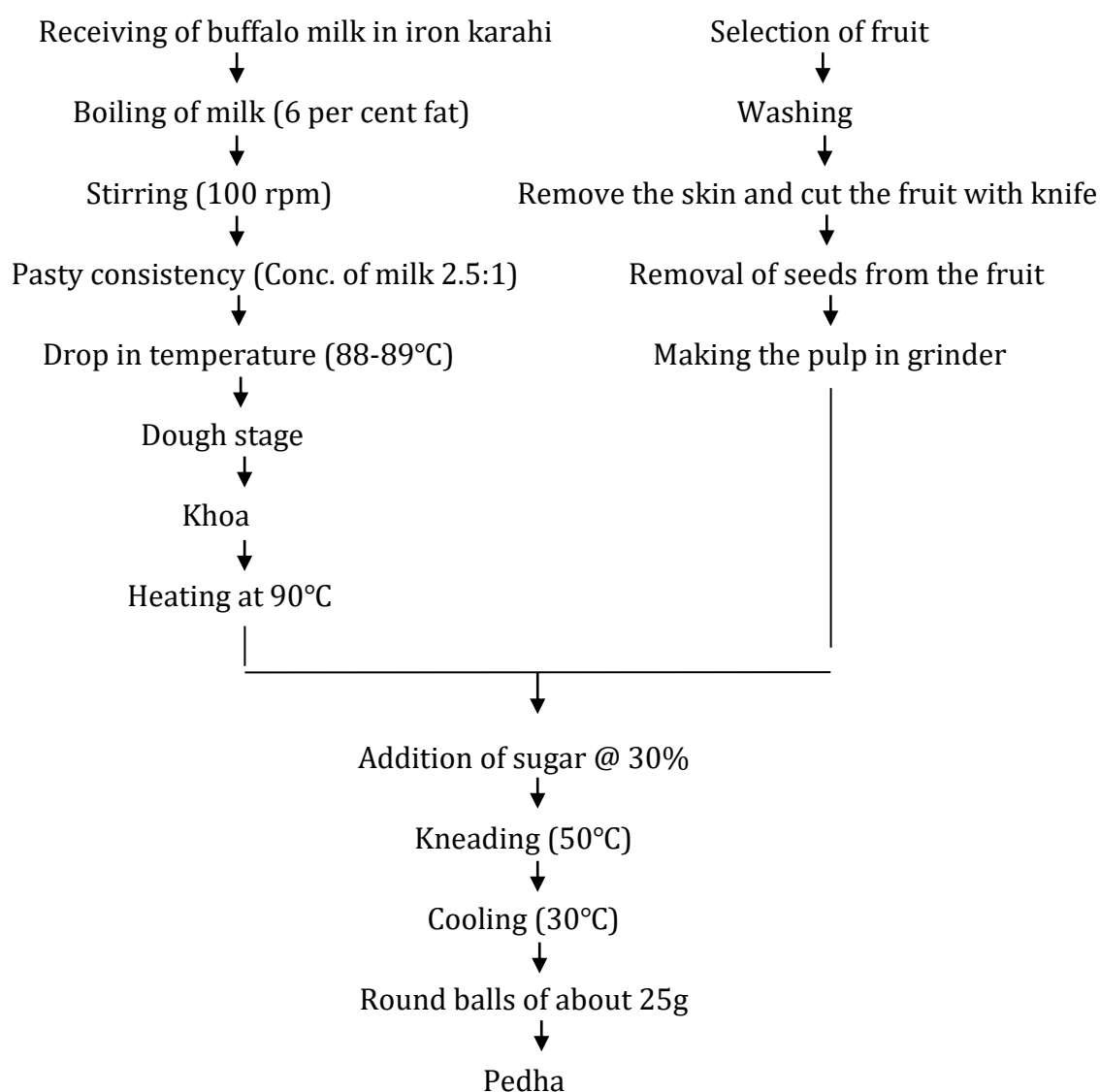
Fig. 1: Preparation of Pickle from Bottle gourd



Storage

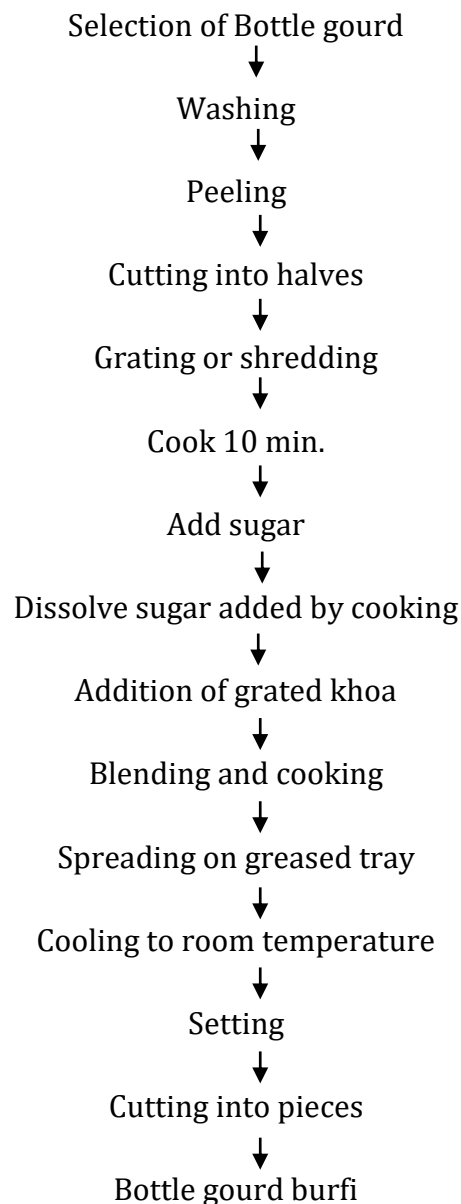
Pingale and Dabhade, 2013

- 2. Bottle Gourd Pedha:** *Pedha* is a khoa based milk product. The production of *Pedha* in India is higher than other milk based sweets using khoa as basic ingredient. *Pedha* has special importance in various celebrations like inaugural functions, wedding, celebrating exam success or other such events. *Pedha* consist of sugar, milk solids and other additives and is highly nutritious.

Fig. 2: Preparation of Pedha from Bottle gourd

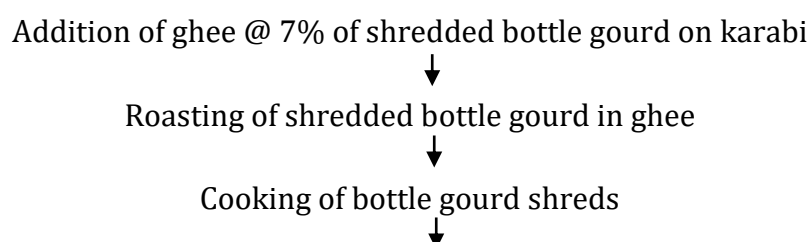
Ghule et al., 2013

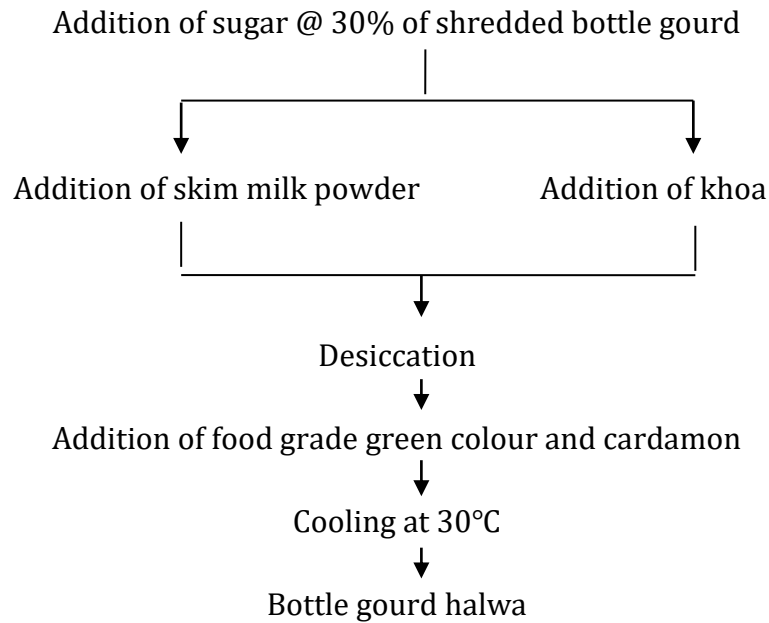
- 3. Bottle Gourd Burfi:** In India one of the most famous sweet prepared from khoa is burfi. Burfi consist of a blend of concentrated milk solids (khoa) and sugar which forms a homogenous consistency followed by cooling and slicing into specific shape.

Fig. 3: Preparation of Burfi from Bottle gourd

Anurag and Chawla, 2016

- 4. Bottle Gourd Halwa:** Halwa (halvah or halva) is a local confection recipe of India. Among North Indians, bottle gourd halwa is very famous sweet. It is prepared traditionally by roasting and cooking of main ingredients in ghee followed by incorporation of sugar and khoa.

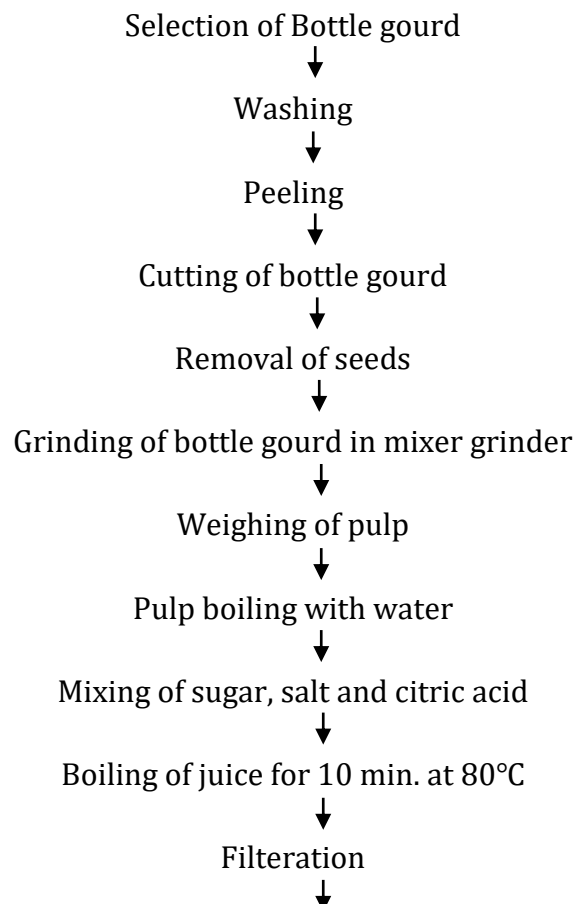
Fig. 4: Preparation of Halwa from Bottle gourd

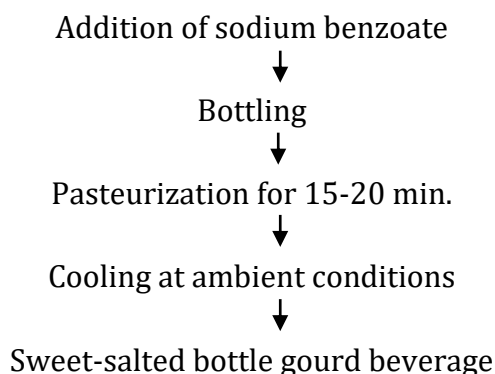


Velpula et al., 2018

5. Sweet-Salted Bottle Gourd Beverage: Beverage is any kind of liquid whether water, tea, coffee, milk, juice and beer that can quench the thirst. Beverage can be hot and cold or an alcoholic item. Term beverage can be used for everything that a person can drink.

Fig. 5: Preparation of Sweet-Salted Beverage from Bottle gourd

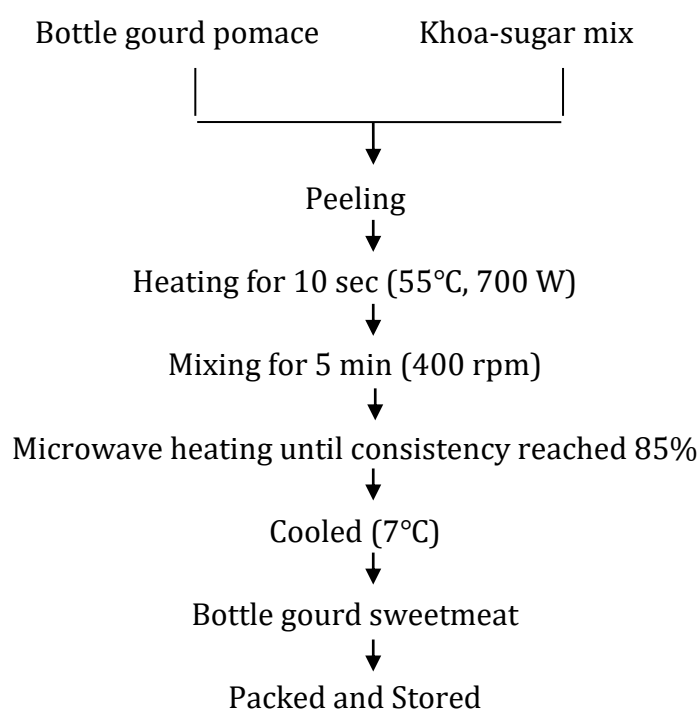




Verma, 2009

6. **Bottle Gourd Sweetmeat:** The term sweetmeat is generally referred as sweet confections or candies. Sweetmeat is often abbreviated simply to 'sweets'. It was initially started as a way for preserving nuts and fruits with addition of sugar.

Fig. 6: Preparation of Sweetmeat from Bottle gourd



Bhat et al., 2018

CONCLUSION

Presently interest in herbal medicines is increasing worldwide for their ability to treat various diseases. Although numerous studies on Indian botanicals have been conducted, but only few marketable drugs have entered the evidence based therapeutics. Among several vegetables bottle gourd posses maximum therapeutic applications like anti-ulcer agent, antidote for some poisons, cardio protective effect, anti-hepatotoxis property etc. Various essential constituents which are necessary for better health are

present in bottle gourd. Therefore inclusion of bottle gourd in the diet promotes health benefits and protect against several diseases.

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