



ISSN (E): 2277-7695

ISSN (P): 2349-8242

NAAS Rating: 5.23

TPI 2023; 12(10): 67-70

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[www.thepharmajournal.com](http://www.thepharmajournal.com)

Received: 24-08-2023

Accepted: 30-09-2023

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## Studies on sensory characteristics on herbal agathi peda

**Raj Kumar, BK Singh and BK Bharti**

**Abstract**

Traditional Indian dairy products have always been an integral element of India's socio-cultural life. Buffalo milk is preferred for making dairy products like paneer, basundi and khoa based sweets like peda, burfi etc. because it gives soft and smooth body, compact and soft structure of the final product. In the present study, khoa was prepared with *S. grandiflora* as an herb. There were three concentrations of herbs *S. grandiflora* viz. 1.5%, 3.0% and 3.5% were used for preparation of herbal peda. The Peda with *S. grandiflora* flower powder produced a much lower score for colour than the peda without *S. grandiflora* flower powder. Additionally, an increase in *S. grandiflora* flower powder concentration range 1.5 to 4.5 percent considerably lessened score colour. Peda with varying quantities of herbs (1.5%, 3.0% and 4.5%) as compared to control showed a significant decline in body and texture score. Increased *S. grandiflora* flower powder reduced the body and texture scores. A substantial fall in sweetness- score was seen when *S. grandiflora* flower powder content was increased herbs from 1.5 to 4.5 percent. Control (T<sub>0</sub>) sample received a considerably score decreased as *S. grandiflora* flower powder addition increased in the Peda with varying quantities of *S. grandiflora* flower powder.

**Keywords:** Peda, khoa, *S. grandiflora*, sensory score, colour, overall acceptability

**Introduction**

Traditional Indian dairy products have been an integral element of India's socio-cultural life. Consumption of traditional dairy products is likely to increase at an annual rate of 20 percent, but in the west region, the growth rate is relatively much lower between 5-10% (Gavhane *et al.*, 2013) [3]. The commercial perspectives offered by the traditional dairies of India launch a comprehensive look at the organized dairy sector experts (Bandyopadhyay *et al.*, 2006) [1]. Buffalo milk is preferred for making dairy products like paneer, basundi and khoa based sweets like peda, burfi, gulab jamun etc. as compared with cow milk and goat milk, because it gives soft and smooth body, compact and soft in homogeneous structure of the final product. Khoa plays significant position in the field of traditional dairy products. According to Food Safety and Standard Regulations (FSSR, 2011) [2]. Khoa, by whatever variety of names it is sold like Pindi, Danedar, Dhap, Mawa or Kava, means the product obtained from cow or buffalo or goat or sheep milk or milk solids or a combination thereof by rapid drying. The milk fat content shall not be less than 30% on dry weight basis of finished product. Khoa may contain citric acid not more than 0.1 percent by weight. It shall be free from added starch, added sugar and added colouring matter. Varieties of khoa are prepared in the market and are transformed into peda, burfi, gulabjamun and kalakand. Peda is of great commercial importance because they are popular throughout the country and have a relatively long shelf life as compared to other sweets (Naresh *et al.*, 2009) [7]. Peda has a longer shelf life because it contains less moisture. It is made by combining khoa with appropriate amount of sugar. Peda has a coarse granular texture and a light-yellow tint.

*Sesbania grandiflora* is sometimes referred to as agathi or the vegetable hummingbird. It is a member of the *Fabaceae* family. Traditional ayurveda medicine utilizes the *S. grandiflora* tree in all of its parts for its beneficial medicinal properties. The seeds of *S. grandiflora* are edible straight from the pod, and they are widely utilized in many cuisines because to their impressive nutritious profile. Agathi flowers are full with a myriad of nutrients of protein, minerals and vitamins. *S. grandiflora* is an excellent provider of vitamins A, folate, thiamine, and niacin. Agathi are rich in vitamins and minerals and have advantage to anti-inflammatory, analgesic, and antipyretic effects (Tamboli *et al.*, 2000) [14]. *S. grandiflora* flowers are of immense values having highly medicinal values like it can cure migraine and headache. It can also regulate diabetes (Prasanna *et al.*, 2018) [12].

## Materials and Methods

This experimental details employed in the present study entitled “Studies on sensory characteristics on herbal agathi peda” along with the information pertaining to the raw materials utilized, methodologies and analytical procedures. All experimental samples of investigation were prepared and analyzed at the different laboratory of Department of Dairy Technology of Sanjay Gandhi Institute of Dairy Technology, Bihar Animal Sciences University, Patna.

### Materials required

**Raw milk:** Fresh, clean and good quality Buffalo milk was purchased from booth of Sudha milk parlor, Patna Dairy Project, Patna.

**Agathi flower:** Good quality of Agathi flower required for the preparation of Herbal Agathi Peda was purchased from local market of Patna.

**Common sugar:** Good quality common sugar was purchased from the local market for the preparation of Herbal Agathi Peda.

**Chemicals:** The chemicals used in the investigation of various physio- chemical and microbiological parameters were of analytical grade (AR).

**Karahi and Kunthi:** Karahi and kunthi used in the preparation of Herbal Agathi Peda was made up of stainless steel.

**Packaging material:** Prepared Herbal Agathi Peda were wrapped in parchment paper and packed in cardboard box 200 g and stored at refrigeration temperature (4-5<sup>0</sup>C) till further analysis.

**Glass wares:** Required glass wares (Burette, pipette, conical flask, beaker and Petri dish) used were Borosil make laboratory glassware

**Electric Mixer:** Electric grinder was used for the preparation of *S. grandiflora* flower powder.

### Preparation of *S. grandiflora* (Agathi) flower powder

*S. grandiflora* (Agathi) flower powder was obtained by grinding the Agathi flower. First collection of good quality of agathi flower then washed properly using potable water. After washing the flower was sun dried. After proper drying of flower, it was grinded using mixer grinder. *S. grandiflora* (agathi) flower powder prepared and kept in a cleaned jar until used and finely prepared the Herbal Agathi (*S. grandiflora*) powder.

### Optimization the level of herbal powder in preparation of Peda

Different level of herbal powder was selected. Four different samples were prepared varying in the herbal powder content in the range of 0% for control, T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> level of agathi powder were 1.5%, 3.0% and 4.5% respectively. After the addition of herbal powder at different level, the samples were studied for sensory properties. The developed technology for the preparation of herbal Peda containing herbal powder at different level was selected on the basis of sensory evaluation. After preparation of herbal Peda, it was packed in cardboard

boxes and stored at 4° C for further analysis.

Treatment combination used for preparation of herbal agathi peda as detailed below:

T<sub>0</sub> – Buffalo milk (6.0% fat, 9.0% SNF) (control)

T<sub>1</sub> – Khoa+ *S. grandiflora* Flower Powder @ 1.5% on khoa weight basis

T<sub>2</sub> - Khoa + *S. grandiflora* Flower Powder @ 3.0% on khoa weight basis.

T<sub>3</sub> - Khoa + *S. grandiflora* Flower Powder @ 4.5% on khoa weight basis.

In above preparations of Peda sugar was added @ 30% of khoa weight basis.

### Sensory evaluation

#### 9-point hedonic scale

The Herbal Peda were evaluated for their acceptability on the basis of attribute viz. flavour, mouthfeel/ body and texture, colour and appearance and overall acceptability. Sensory evaluation was carried out by presenting approximately 20 g of Herbal Peda sample to semi-trained panelists each, selected from the faculty of Sanjay Gandhi Institute of Dairy Technology. Nine-point hedonic scale was used to carry out the evaluation of samples for all the sensory attributes. For sensory evaluation of attributes viz. flavor, mouthfeel/ body & texture, colour & appearance and overall acceptability, panelists were taste the sample and observe for the characteristics as per protocols of sensory evaluation. The nine-point hedonic scale include various scales of grading i.e., liked extremely (9), liked very much (8), liked moderately (7), liked slightly (6), neither liked nor disliked (5), disliked slightly (4), disliked moderately (3), disliked very much (2), disliked extremely (1) (Lawless and Heymann, 2010)<sup>[6]</sup>.

### Statistical Analysis

Mean ± standard deviation was calculated using Microsoft excel (Microsoft office 2016) using data analysis tool ANOVA.

### Results and Discussion

The study entitled “Studies on sensory characteristics on herbal agathi peda” was undertaken to unveil it from e various aspect. The Herbal Agathi Peda varying in Agathi powder content were selected on the basis of their sensory parameter. The results obtained during the study are presented and discussed in this chapter.

Peda prepared by the process optimized by Shrikant *et al.*, 2019<sup>[13]</sup> and Pandey *et al.*, (2018)<sup>[10]</sup>. This Peda was further processed and treated to prepare herbal agathi peda by following the process optimized by Pandey *et al.*, (2018)<sup>[10]</sup>. The herbal agathi peda were manufactured by using Agathi Powder varying in amount i.e. 0.0%, 1.5%, 3.0%, and 4.5%.

#### Colour and appearance of herbal agathi peda

According to the results, the control Peda T<sub>0</sub> scored much higher (8.35) than the treated peda with agathi powder T<sub>1</sub>, T<sub>2</sub>, and T<sub>3</sub> were 8.07, 7.75, and 6.95, respectively for colour. As varying levels of agathi powder (1.5, 3.0, and 4.5%) were present in the Peda in T<sub>1</sub>, T<sub>2</sub>, and T<sub>3</sub>, the score decreased significantly as compared to the control peda (T<sub>0</sub>). Similar results were observed by Pawar (2008)<sup>[11]</sup>, sago Peda's average colour and attractiveness scores varies from 6.95 to 8.43. According to Nawadkar (2007)<sup>[8]</sup>, the Parbhani Peda, Gangakhed kalam, and Kuntalgiri Peda average scores for

colour and appearance were 7.27, 8.10, and 8.42, respectively. According to Jadhav (2010) <sup>[5]</sup>, the plain Peda was chosen from a local market in the Latur district had average scores for colour. He observed that the average score of laboratory-made plain Peda (T<sub>0</sub>), market plain Peda (T<sub>1</sub>), plain Peda from Udgir (T<sub>2</sub>), and plain Peda from Chakur (T<sub>3</sub>) were, respectively 7.4, 7.4, 7.3, and 6.3. The findings of the previously mentioned research were almost similar results acquired in the current examination for colour and appearance score.

#### Body and texture score of herbal peda

The average body and texture scores for agathi powder-infused peda of T<sub>0</sub>, T<sub>1</sub>, T<sub>2</sub>, and T<sub>3</sub> were 8.45, 7.68, 7.60, and 6.57 respectively. Significant differences existed between each treatment from the others. According to the findings, the control peda scored much higher than the peda with *S. grandiflora* flower powder. According to Ghorpade *et al.* (2004) <sup>[4]</sup>. The body and texture of laboratory-made kalam received a mean value of sensory score of 7.9. Naresh *et al.*, (2009) <sup>[7]</sup> investigated that the impact of microwave heat treatment on the sensory characteristics of peda. They reported sensory scores for body and texture that ranged from 7.68 to 7.50.

#### Flavour scores in herbal agathi peda

The flavour scores of the treated samples T<sub>1</sub>, T<sub>2</sub>, and T<sub>3</sub>, as well as the control peda (T<sub>0</sub>), ranged from 8.57 to 7.12. The highest score was achieved by control (T<sub>0</sub>), followed by T<sub>1</sub>, T<sub>2</sub>, and T<sub>3</sub> (8.17, 7.80, and 7.12, respectively). However, at various levels of agathi powder in peda, the flavour score of control sample T<sub>0</sub> changes significantly from T<sub>1</sub>, T<sub>2</sub>, and T<sub>3</sub>. This was caused by a strong substance found in *S. grandiflora* flower powder. According to Pawar (2008) <sup>[11]</sup>, the average score for sago peda flavour ranged from 7.18 to 8.43. Nawadkar (2007) <sup>[8]</sup> observed that the average value for the flavour of peda from the Parbhani local market, kalam from Gangakhed, and Peda from Kuntalgiri was 7.27, 8.10 and 8.42 respectively. According to Jadhav (2010) <sup>[5]</sup> the mean scores of flavour of laboratory-made plain peda, market plain peda from Latur, market plain Peda from Udgir, and market plain Peda from Chakur were 7.4, 7.4, 7.3 and 6.3 respectively.

#### Overall acceptability of herbal agathi peda

The mean overall acceptability score for *S. grandiflora* flower powder-infused peda (T<sub>1</sub>, T<sub>2</sub>, and T<sub>3</sub>) was 7.98, 7.45 and 6.86 respectively, compared to 8.61 for control peda (T<sub>0</sub>). In comparison to the control, the overall acceptability score considerably dropped at the 1.5, 3.0 and 4.5% levels of *S. grandiflora* flower powder addition T<sub>1</sub>, T<sub>2</sub>, and T<sub>3</sub>, all received higher scores than T<sub>0</sub>, who received the highest score. The outcome showed a downward trend in the overall acceptability score when the % of *S. grandiflora* flower powder in peda from 1.5 to 4.5 percent. According to Ghorpade *et al.*, (2004) <sup>[4]</sup>, the mean overall acceptability score for laboratory-made kalam's was 8.1. According to Nawadkar (2007) <sup>[8]</sup>, the Parbhani Peda, Gangakhed kalam, and Kuntalgiri Peda average scores for general acceptability were 7.29, 7.98, and 8.33 respectively. According to Jadhav (2010) <sup>[5]</sup>, the average score for market-made plain Peda from the Latur district, market plain Peda from Latur, market plain Peda from Udgir, and market plain Peda from Chakur were 7.5, 7.3, 7.1, and 6.2 respectively.

#### Conclusions

The Peda with *s. grandiflora* flower powder received a much lower score for colour than the peda without *s. grandiflora* flower powder. Additionally, an increase in *S. grandiflora* flower powder concentration from 1.5 to 4.5 percent considerably lessened score colour and look. Peda with varying quantities of *S. grandiflora* flower powder (1.5, 3 and 4.5%) as compared to control showed a significant decline in body and texture score. Increased level of *S. grandiflora* flower powder reduced the body and texture scores. The Peda with *S. grandiflora* flower powder scored much lower on the sweetness score than the peda without *S. grandiflora* flower powder. Additionally, a substantial fall in sweetness score was seen when *S. grandiflora* flower powder content was increased from 1.5 to 4.5 percent. Control (T<sub>0</sub>) received a considerably score decreased as *S. grandiflora* flower powder addition increased in the Peda with varying quantities of *S. grandiflora* flower powder. The control overall acceptance rating T<sub>1</sub> (8.01), T<sub>2</sub> variation was also seen across the samples that were treated with various amounts of *S. grandiflora* flower powder (1.5, 3.0, and 4.5%). When compared to Peda containing 1.5, 3.0, and 4.5% *S. grandiflora* flower powder, control peda received the highest scores for all sensory qualities. Of the Peda with various amounts of *S. grandiflora* flower powder added, the 1.5% level received a higher score than the 3% and 4.5% levels. The study's findings led to the conclusion that *S. grandiflora* flower powder may be successfully added to peda without degrading the peda's sensory appeal. However, the acceptability was within the range of some what like for the blending of 4.5% *S. grandiflora*.

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