



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; 12(3): 1301-1303
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www.thepharmajournal.com
Received: 02-12-2022
Accepted: 05-01-2023

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To study sensory evaluation of dried crushed Mahua (*Madhuca longifolia*) flowers in preparation of milk shake

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Abstract

The present investigation entitled “to study sensory evaluation of dried crushed mahua (*Madhuca longifolia*) flowers in preparation of milk shake.” was undertaken during the year 2022. Milk shake was prepared with different combinations of milk and mahua pulp viz. 100:00 (T₁), 95:05 (T₂), 92.5:7.5 (T₃), 90:10 (T₄), and 87.5:12.5 (T₅). Sensory evaluation carried out by five judges showed that the different levels of mahua pulp had a significant effect on sensory attributes such as flavour, body and texture, colour and appearance and overall acceptability of mahua milk shake. Milk shake prepared by blending with 5 parts of mahua pulp (T₂) had secured the highest score.

Keywords: Milk shake, cow milk, mahua flowers, sensory evaluation, flavour, body and texture, colour and appearance

Introduction

Milk being a perishable product gets spoiled quickly, if not treated properly. Besides direct consumption as market milk, surplus milk is converted in to various milk products as per the liking of the people from various regions of the country. Delicious recipes are prepared from the milk by converting it in to desiccated, coagulated, fermented or frozen milk products. Traditional dairy products like cream, butter, cheese, condensed and dried milk and indigenous milk products are produced and consumed in large quantities in the country. In recent years, there is a specific trend noticed in the consumption of dairy-based products. The varieties of milk products and dairy based milk products are coming up in the market with its increased palatability and fascinating forms with added newer and newer formulations.

Milk shake, a product of western origin which is obtained by preparing mix containing milk, skim milk powder, stabilizer and sugar and speed mixing the product in mixer to make it pourable and generate foam in it (Sharma and Gupta, 1978) [13]. It has low fat and sugar contents and higher milk solid not fat (MSNF) content than ice-cream. The milk shakes that are commonly sold in the Indian sub-continent consist of sweetened cold milk added with colouring and flavouring agents without freezing but vigorously shake. The most commonly used flavour blends are of rose, coffee and chocolate. Milk shake is sold by fruit juice centers in many parts of our country during the whole years. It is liked mostly by consumer as it is palatable and nutritional (Kadav, 2001) [6].

Mahua flowers are a good source of natural sugars and various Phyto-chemicals contributing to various properties such as antibacterial, anticancer, hepatoprotective, antihyperglycemic, analgesic activities, etc. besides its utilization as food, feed and fodder. Mahua flowers are well known for their high reducing sugar and nutrient content. They are edible and used as a sweetener in preparation of many local dishes like halwa, kheer, puri and burfi (Patel and Naik, 2008) [9] in the mahua production belt of India. Various research studies have put forward the preparation of sugar syrup from dry and fresh mahua flowers which can further be used as a sweetening agent This sweetener can be used further as syrup suitable for making good quality jams, candies, jelly, sauce, confectionery goods and as a substitute for brown sugar (Chand and Mahapatra, 1983) [2]; (Abhyankar and Narayana, 1942) [1]; (Patel and Naik, 2010) [10]. Candy, cake, ready to serve (RTS), toffee, squash, laddoo bar are some value-added products developed from dry Mahua flowers (Dash, 2017) [3].

Materials and Methods

Cow milk was obtained from the Section of Animal Husbandry and Dairy Science, College of Agriculture, Nagpur. Dried mahua flowers, good quality cane sugar, Sodium alginate was purchased from the market of Nagpur. Milk shake was prepared as per. Minor modification. Were some preliminary trials were conducted to determine the range of Mahua pulp for incorporation in milkshake. The trials with five levels of Mahua pulp (0, 5, 7.5, 10 and 12.5%) were selected on the basis of preliminary trials for further studies five replication.

Treatment Details:

- T1 - 100% Milk + 0% Mahua pulp + 7% Sugar
 T2 - 95% Milk + 5% Mahua pulp + 7% Sugar
 T3 - 92.5% Milk + 7.5% Mahua pulp + 7% Sugar
 T4 - 90% Milk + 10% Mahua pulp + 7% Sugar
 T5 - 87.5% Milk + 12.5% Mahua pulp + 7% Sugar

Preparation of Mahua milk shake

Mahua milk shake was prepared by following the procedure as described by Sharma and Gupta (1978) [13] with slight modification. The Cow milk was pasteurized to 72 °C for 30 minutes. Stabilizer (sodium alginate) was added @ 0.4 per cent. The flow chart of preparation of mahua milk shake is depicted (Fig.1).

The Mahua milk shake was subjected to sensory evaluation by a panel of five trained judges from Dept. of Animal Husbandry and Dairy Science, College of Agriculture, Nagpur, using 9-point Hedonic scale as described by Gupta (1999) [4].

It was judged for flavour, body and texture, colour and appearance and overall acceptability. The results obtained during the course of investigation were subjected to statistical analysis by using Completely Randomized Design (CRD) as described by Panse and Sukhatme (1967) [8].

Flow chart

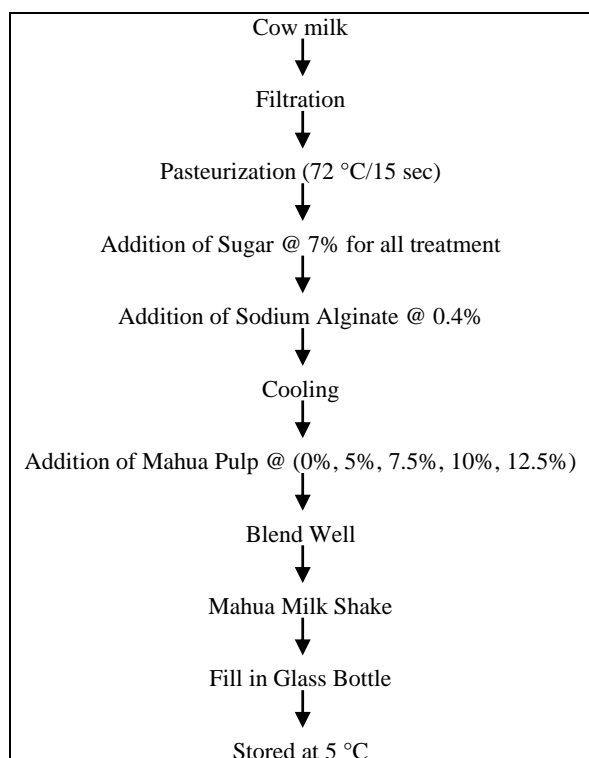


Fig No 1: Preparation of milkshake blending with Mahua pulp.

Results and Discussion

Table 1: Table for sensory attributes of milk shake as affected by different levels of mahua pulp

Treatment	Parameters		
	Flavour (45)	Body and texture (35)	Colour and Appearance (20)
T ₁	41.97	31.41	17.87
T ₂	42.45	32.22	17.87
T ₃	41.14	29.77	17.07
T ₄	39.62	28.36	16.72
T ₅	38.96	27.05	15.94
S.E (m) ±	0.753	0.406	0.189
C.D	2.237	1.206	0.562
Result	Sig.	Sig.	Sig.

Flavour

It is revealed from table 1 that, flavour of milk shake was significantly affected due to addition of mahua pulp at different levels. The mean score of flavour attribute of milk shake were 41.97, 42.45, 41.14, 39.62 and 38.96 under the treatments T₁, T₂, T₃, T₄ and T₅ respectively. The highest score (42.45) was obtained in milk shake prepared with 5 per cent mahua pulp (T₂), while the lowest score (38.96) was obtained in milk shake prepared with addition of 12.5 per cent mahua pulp (T₅). The results showed that the milk shake prepared with 5 per cent mahua pulp was superior over 0 per cent, 7.5 per cent, 10 per cent and 12.5 per cent. It showed that decrease in the level of mahua pulp increased the flavour score of milk shake. The results of the present investigation are comparable with the findings of Pooja Mule (2012) [11] she prepared fig milk shake and reported that as the percentage of fig pulp in the blend increase, the flavour score of the product also decreased.

Body and texture

It is revealed from table 1 that, the body and texture score of milk shake was significantly affected due to addition of different levels of mahua pulp. The average scores for body and texture attributes of milk shake were 31.41, 32.22, 29.77, 28.36 and 27.05 for treatments T₁, T₂, T₃, T₄ and T₅ respectively. The significantly highest score was (32.22) received by milk shake prepared with 5 per cent mahua pulp i.e. treatment (T₂) which was superior treatment in respect of body and texture of milk shake, while the lowest score (27.05) was received by milk shake prepared with addition of 12.5 per cent mahua pulp i.e. treatment (T₅). The results showed that, with increase in the levels of mahua pulp there was decrease in the body and texture score of mahua milk shake. The results of the present investigation are in line with the findings of Kuchekar (2011) [7], they prepared almond milk shake and reported that the score for body and texture showed decreasing trend with increasing levels of mahua pulp.

Colour and appearance

It is revealed from table 1 that, the colour and appearance of milk shake was significantly affected due to addition of different levels of mahua pulp. The average score for colour and appearance of milk shake were 17.87, 17.87, 17.07, 16.72 and 15.94 under the treatments T₁, T₂, T₃, T₄ and T₅ respectively. The significantly highest score was (17.87) received by milk shake prepared with addition of 5 per cent mahua pulp i.e. under (T₂) treatment which was superior treatment in respect of colour and appearance, while lowest

score (15.94) was received by milk shake prepared with addition of 12.5 per cent mahua pulp i.e. (T5). The colour and appearance score of milk shake was noted that the increase level of mahua pulp in milk shake decreased the score of colour and appearance slightly. The results of the present investigation are in line with the findings of Jadhav *et al.* (2003) [5] analysed that the score for colour and appearance ranged between 8.22-7.57 for T₁ and T₃ respectively it was noted that the increase in level of sapota in fig milk shake decreased the colour and score slightly.

Table 2: Overall acceptability score of milk shake blended with different levels of mahua pulp on the basis of 9-point hedonic scale

Treatments	Replications					
	R-I	R-II	R-III	R-IV	R-V	Mean
T ₁	6.00	7.60	7.00	7.40	7.00	7.00
T ₂	8.80	8.40	8.80	8.40	8.60	8.60
T ₃	7.00	7.20	6.60	7.00	6.40	6.84
T ₄	6.90	7.10	6.58	6.80	6.36	6.74
T ₅	6.00	6.20	6.60	6.60	5.80	6.24
S. E. (m) ±						0.172
C.D. at 5%						0.510
Result						Sig.

Overall acceptability

From the table 2. results indicated that, the mean scores for overall acceptability of milk shake prepared in the proportion of 100:00 (T₁), 95:05 (T₂), 92.5: 7.5 (T₃), 90:10 (T₄) and 87.5:12.5 (T₅) milk to mahua pulp were 7.00, 8.60 and 6.84, 6.74 and 6.24 respectively. The score of mahua milk shake (9-point hedonic scale) prepared with addition of 5 per cent mahua pulp (T₂) was highest amongst all the treatments. From the results it is inferred that, milk shake prepared with addition of 5 parts of mahua pulp had highest overall acceptability (8.60 out of 9) as compared to 7.00 (T₁), 6.84 (T₃), 6.74 (T₄) and 6.24 (T₅). The results of the present study are in agreement with the findings of Jadhav (2003) [5] they prepared sapota milk shake and stated that the overall acceptability score ranged from 7.12 to 8.05 it was observed that as proportion of sapota increase in the sapota milk shake the overall acceptability score decreased. Likewise, the overall acceptability score of fig milk shake ranged from 8.11 to 8.30 as reported by Mule *et al.* (2014) [12].

Conclusion

It may concluded that the superior quality of milk shake can be prepared by addition of 5 parts of mahua pulp and 95 parts milk and 7% sugar which is common for all treatments. In respect of physico-chemical composition of milk shake fat, protein and total solid was significantly decreased while ash, titratable acidity and moisture percentage significantly increased with increased levels of mahua pulp.

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