Original Research Article

Development of Freshly Prepared Phalsa-Pear Blended Beverage

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ABSTRACT

Phalsa (Grewia subinaequalis L.) fruit is highly perishable in nature and has very short shelf life. Due to its acidic taste it is not palatable, hence processing is essential. Blending of two or more juices is thought to be a convenient alternate for utilizing them in some value added fruit drinks which will be of high quality in respect to both sensory and nutritional aspects. In the present study, phalsa pulp and pear juice were blended in the ratio of 100:00, 95:05, 90:10, 85:15, 80:20, 75:25, 70:30, 65:35, 60:40, 55:45 and 50:50 for the preparation of crush as per FPO specifications. Fresh fruit of phalsa had total soluble solids, acidity, pH, reducing sugar, total sugars, ascorbic acid, anthocyanin, tannin, iron and phosphorous contents of 15.50 °Brix, 1.66 %, 3.50, 12.10 %, 13.24 %, 8.90, 74.12, 1.92, 1.05 and 22.2 mg/100 g, respectively. Whereas, fresh pear fruit recorded the total soluble solids, acidity, pH, reducing sugar, total sugar, ascorbic acid, tannin, iron and phosphorous contents as 12.00 °Brix, 0.24 %, 3.80, 8.72 %, 10.26 %, 2.80, 106.2, 0.20 and 10.2 mg/100 ml, respectively. In the freshly prepared blended crush, highest reducing sugar (32.62 %), total sugar (43.51 %), ascorbic acid (7.38 mg/100 ml) and anthocyanin (18.92 mg/100 ml), tannin (0.43 mg/100ml), iron (0.31 mg/100 ml) and phosphorus (6.87 mg/100 ml) were recorded in treatment T₅ (100:00::phalsa: pear) while as the lowest value were recorded in treatment T₁₁ (50:50::phalsa: pear). Sensory evaluation of blended crush revealed that the highest score of colour (7.72), body (7.34), aroma (7.45), taste (7.44) and overall acceptability (7.48) was recorded in treatment T₅ (80:20:: phalsa: pear), respectively.

KEYWORDS
Phalsa, Pear, Blend, Beverages, Crush

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INTRODUCTION

Phalsa (Grewia subinaequalis L.), also known as star apple is a subtropical fruit of India. It belongs to the family “Tiliaceae". This family has about 41 genera and 400 species which are mostly distributed in the tropical and subtropical region of the world. In India, it is commercially grown in Punjab, Haryana, Rajasthan, Uttar Pradesh and Madhya Pradesh. Besides these states, it is also cultivated on limited scale in Maharashtra, Gujarat, Andhra Pradesh, Bihar and West Bengal (Kumar et al., 2014). In Jammu and Kashmir state, it is not cultivated commercially but grown in kandi and dry land areas of Kathua, Samba, Jammu, Udhampur, Rajouri and Reasi districts. From these locations, it could find ready market for disposal. Phalsa fruit is ready for picking in S.
India from March to April; whereas in N. India it is harvested in the months of May June. The fruits are highly perishable in nature and due to its perishability, it cannot be exported but its processed products are very appreciable. Ripe fruits are consumed fresh in desserts, or processed into refreshing soft drinks like squash, RTS, sharbat etc. which are enjoyed during hot summer months in India.

The attractive crimson red to dark purple colour of phalsa fruit is due to anthocyanin pigments mainly, delphinidin-3-glucoside, cyanidin-3-glucoside and pelargonidin-3, 5 diglucoside. The major phyto-chemical compounds present in the fruit of phalsa are triterpenoids, fatty component, flavonoids (quercetin, quercetin-3-O-β-D-glucoside and naringenin-7-O-β-D-glucoside), steriods, saponins and tannins. The fruits possess very high antioxidant activity due to presence of vitamin C, phenolics, flavonoids, tannins and anthocyanin. In the fruit, highest antioxidant activities are found in fruit peel followed by pulp and seeds (Tiwari et al., 2014). Sand pear (Pyrus pyrifolia L.) is an important pome fruit of family “Rosaceae”. Pear has lowered acidity, insipid flavor and grittiness, which are the major constraint for its large scale processing. Therefore, owing to presence of such attributes, these fruits are rarely used as fresh or in processing and hence fetch lower price to the grower. Pear fruit is helpful in maintaining acid base balance in human body but the utilization of the hard type of pear (patharnakh) has not received much attention for processing so far. Thus blending of phalsa pulp and pear juice offers many opportunities to develop balanced health product high in quality with respect to both sensory and nutritional aspects.

Materials and Methods

Ripened fruits of Phalsa (Grewia subinaequalis L.) were procured from Raya Suchani area of district Samba, J&K and fruits of Pear (Pyrus pyrifolia L.) cv. Patharnakh were procured from revenue orchard of Advance Centre for Horticulture Research (ACHR), Udheywalla, SKUAST-Jammu. Both Phalsa and pear fruits were transported to pilot plant of Division of Food Science and Technology, SKUAST-J, Chatha for further processing. The diseased, defective and unripe fruits were sorted out and thereafter healthy and ripe fruits were retained for extraction of pulp. The phalsa and the pear pulp/juice were blended with each other in different ratios for developing crush (Table 1).

The desired quantity of sugar and citric acid was added in warm water and the solution is strained of through muslin cloth. The solution is added in phalsa-pear blend so as to maintain its total soluble solids as 55 ⁰Brix and an acidity of 1 per cent. The crush prepared was filled in pre-sterilized glass bottle crown corked, processed for 30 min. in boiling water, cooled immediately, labeled. The blended crush was analyzed for physico-chemical and organoleptic evaluation.

Results and Discussion

Physico-chemical composition of fresh fruit

Among most of the fruits; ‘phalsa’ is very small in size comparable with a pea grain. The fruit however possesses an attractive colour ranging from crimson red to dark purple depending upon its state of maturity. The richness of natural colour is due to plant pigments viz., the anthocyanins in the fruit. This confirms the finding of Khurdiya (1979). The phalsa fruit had an average fruit weight of 0.54 g, whereas pulp and seed cum pomace weight per 100 g of fruit was 85 and 14 g, respectively. These findings were in conformity with the findings of Yadav (1999). The total soluble solids, acidity and pH of freshly prepared phalsa pulp were found to be

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15.50 °Brix, 1.66 % and 3.50, respectively, which were in close compliance to the findings of Kaccha et al., (2014), Balaswamy et al., (2011) and Waskar (1985). Reducing sugar, total sugar and ascorbic acid of phalsa pulp were recorded as 12.10 %, 13.24 % and 8.90 mg/100, ml respectively, which were in conformity with the findings of Kumar et al., (2014) and Yadav (1998). Anthocyanin, tannin, iron and phosphorous contents were found to be 74.12, 1.92, 1.05 and 22.20 mg/100 g which were in accordance with the results of Haq et al., (2013), Elhassan and Yagi (2010), Tiwari et al., (2014) and Yadav (1998). Pear fruit cv. "patharnakh" recorded an average fruit weight of 105.5 g, juice weight per 100 g as 63.8 and seed cum pomace as 35 g. These findings were in accordance with the findings of Raj et al., (2011). Total soluble solids, acidity, pH, reducing sugar, total sugar and ascorbic acid and tannin content were found as 12.00 °Brix, 0.24 %, 3.8, 8.72 % and 10.26 %, 2.80 and 106.2 mg/100 ml, respectively were recorded in pear juices which were in close conformity with the findings of Raj et al., (2011), Mahajan et al., (2013), Rani (1981) and Kohli (1979). Pear fruit was found to contain iron and phosphorous content of 0.20 and 10.2 mg/100 ml, respectively (Table 2).

**Table.1 Detail of treatments**

| Treatment | Phalsa pulp | Pear juice |
|-----------|-------------|------------|
| T1        | 100         | 00         |
| T2        | 95          | 05         |
| T3        | 90          | 10         |
| T4        | 85          | 15         |
| T5        | 80          | 20         |
| T6        | 75          | 25         |
| T7        | 70          | 30         |
| T8        | 65          | 35         |
| T9        | 60          | 40         |
| T10       | 55          | 45         |
| T11       | 50          | 50         |

**Table.2 Physico-chemical composition of fresh fruit of phalsa and pear**

|                         | Phalsa | Pear |
|-------------------------|--------|------|
| **Physical parameters**  |        |      |
| Fruit weight (g)        | 0.54   | 105.50 |
| Pulp weight (g/100 g)   | 85.0   | 63.80 |
| Seed cum pomace weight (g/100 g) | 14.0  | 35.0  |
| **Chemical parameters**  |        |      |
| TSS °Brix               | 15.50  | 12.0  |
| Acidity (%)             | 1.66   | 0.24  |
| pH                      | 3.50   | 3.80  |
| Reducing sugar (%)      | 12.10  | 8.72  |
| Total sugar (%)         | 13.24  | 10.26 |
| Ascorbic acid (mg/100 g)| 8.90   | 2.80  |
| Anthocyanin (mg/100 g)  | 74.12  | --    |
| Tannin (mg/100 g)       | 1.92   | 106.20|
| Iron (mg/100 g)         | 1.05   | 0.20  |
| Phosphorus (mg/100 g)   | 22.20  | 10.20 |
Table.3 Chemical composition of freshly prepared phalsa-pear blend

| Ratio of pulp/Juice Phalsa: Pear | TSS (°Brix) | Acidity (%) | pH | Reducing sugar (%) | Total sugar (%) | Ascorbic acid (mg/100 ml) | Anthocyanin (mg/100 ml) | Tannin (mg/100 ml) | Iron (mg/100 ml) | Phosphorus (mg/100 ml) |
|----------------------------------|-------------|-------------|----|-------------------|----------------|--------------------------|--------------------------|----------------|----------------|------------------------|
| T₁(100:0)                        | 15.50       | 1.66        | 3.50 | 12.10             | 13.24          | 8.90                     | 74.12                    | 1.92           | 1.05          | 22.20                   |
| T₂(95:05)                        | 15.00       | 1.41        | 3.52 | 12.07             | 12.94          | 8.62                     | 72.10                    | 6.95           | 1.01          | 22.11                   |
| T₃(90:10)                        | 14.90       | 1.38        | 3.54 | 11.75             | 12.88          | 8.40                     | 67.07                    | 11.32          | 0.99          | 21.86                   |
| T₄(85:15)                        | 14.50       | 1.36        | 3.54 | 11.66             | 12.71          | 7.81                     | 64.02                    | 16.17          | 0.91          | 21.66                   |
| T₅(80:20)                        | 14.00       | 1.35        | 3.55 | 11.27             | 12.53          | 7.70                     | 61.93                    | 21.05          | 0.88          | 21.44                   |
| T₆(75:25)                        | 13.90       | 1.35        | 3.57 | 10.97             | 12.40          | 7.42                     | 57.89                    | 26.16          | 0.78          | 20.91                   |
| T₇(70:30)                        | 13.80       | 1.32        | 3.60 | 10.83             | 12.25          | 7.10                     | 52.65                    | 30.92          | 0.73          | 20.64                   |
| T₈(65:35)                        | 13.30       | 1.26        | 3.63 | 10.55             | 12.14          | 6.78                     | 51.66                    | 35.96          | 0.69          | 20.34                   |
| T₉(60:40)                        | 13.30       | 1.18        | 3.65 | 10.43             | 11.99          | 6.50                     | 47.61                    | 41.44          | 0.66          | 20.04                   |
| T₁₀(55:45)                       | 13.10       | 1.06        | 3.68 | 10.20             | 11.72          | 6.20                     | 42.55                    | 46.51          | 0.61          | 19.88                   |
| T₁₁(50:50)                       | 13.00       | 0.96        | 3.70 | 10.15             | 11.61          | 5.88                     | 40.50                    | 52.89          | 0.59          | 18.96                   |
| Mean                             | 14.02       | 1.29        | 3.58 | 11.08             | 12.40          | 7.39                     | 57.46                    | 26.48          | 0.80          | 20.91                   |

Table.4 Chemical composition of freshly prepared phalsa-pear blended crush

| Ratio of pulp/Juice Phalsa: Pear | TSS (°Brix) | Acidity (%) | pH | Reducing sugar (%) | Total sugar (%) | Ascorbic acid (mg/100ml) | Anthocyanin (mg/100 ml) | Tannin (mg/100 ml) | Iron (mg/100ml) | Phosphorus (mg/100 ml) |
|----------------------------------|-------------|-------------|----|-------------------|----------------|--------------------------|--------------------------|----------------|----------------|------------------------|
| T₁(100:0)                        | 55.0        | 1.0         | 4.16 | 32.62             | 43.51          | 7.38                     | 18.92                    | 0.43           | 0.31          | 6.87                    |
| T₂(95:05)                        | 55.0        | 1.0         | 4.18 | 32.50             | 43.42          | 7.28                     | 18.62                    | 1.08           | 0.28          | 6.79                    |
| T₃(90:10)                        | 55.0        | 1.0         | 4.19 | 32.37             | 43.36          | 7.02                     | 18.43                    | 1.71           | 0.25          | 6.63                    |
| T₄(85:15)                        | 55.0        | 1.0         | 4.21 | 32.27             | 43.33          | 6.94                     | 18.39                    | 1.97           | 0.24          | 6.57                    |
| T₅(80:20)                        | 55.0        | 1.0         | 4.21 | 32.25             | 42.96          | 6.86                     | 17.37                    | 2.09           | 0.21          | 6.51                    |
| T₆(75:25)                        | 55.0        | 1.0         | 4.24 | 32.18             | 42.67          | 5.90                     | 17.22                    | 2.85           | 0.21          | 6.42                    |
| T₇(70:30)                        | 55.0        | 1.0         | 4.26 | 32.14             | 42.61          | 5.85                     | 16.18                    | 3.96           | 0.19          | 6.39                    |
| T₈(65:35)                        | 55.0        | 1.0         | 4.27 | 32.02             | 42.52          | 4.72                     | 15.17                    | 5.99           | 0.17          | 6.36                    |
| T₉(60:40)                        | 55.0        | 1.0         | 4.28 | 31.91             | 42.41          | 4.51                     | 15.13                    | 8.05           | 0.16          | 6.26                    |
| T₁₀(55:45)                       | 55.0        | 1.0         | 4.30 | 31.80             | 42.20          | 4.12                     | 12.92                    | 9.47           | 0.15          | 6.21                    |
| T₁₁(50:50)                       | 55.0        | 1.0         | 4.30 | 31.69             | 42.12          | 4.07                     | 10.75                    | 12.11          | 0.12          | 6.16                    |
| Sem (±)                          | 0.02        | 0.02        | 0.01 | 0.02              | 0.11           | 0.02                     | 0.02                     | 0.01           | 0.06          | 0.01                    |
| CD (5 %)                         | NS          | NS          | 0.03 | 0.07              | 0.33           | 0.07                     | 0.08                     | 0.05           | NS            | 0.05                    |
Table 5: Sensory evaluation of freshly prepared phalsa-pear blended crush

| Ratio of pulp/Juice Phalsa: Pear | Colour | Body | Aroma | Taste | Overall acceptability |
|---------------------------------|--------|------|-------|-------|-----------------------|
| T₁(100:0)                       | 7.53   | 6.79 | 6.82  | 6.82  | 6.99                  |
| T₂(95:05)                       | 7.45   | 6.87 | 6.79  | 6.91  | 7.00                  |
| T₃(90:10)                       | 7.41   | 6.95 | 6.87  | 7.06  | 7.07                  |
| T₄(85:15)                       | 7.38   | 6.98 | 6.53  | 7.32  | 7.05                  |
| T₅(80:20)                       | 7.72   | 7.34 | 7.45  | 7.44  | 7.48                  |
| T₆(75:25)                       | 7.31   | 7.29 | 7.19  | 7.35  | 7.28                  |
| T₇(70:30)                       | 7.04   | 7.21 | 7.12  | 7.29  | 7.16                  |
| T₈(65:35)                       | 6.93   | 6.99 | 7.11  | 6.98  | 7.00                  |
| T₉(60:40)                       | 6.65   | 6.65 | 6.45  | 6.85  | 6.65                  |
| T₁₀(55:45)                      | 6.44   | 6.23 | 6.12  | 6.75  | 6.38                  |
| T₁₁(50:50)                      | 6.12   | 6.12 | 6.07  | 6.72  | 6.25                  |
| Sem (±)                         | 0.02   | 0.01 | 0.02  | 0.02  | 0.02                  |
| CD (5 %)                        | 0.06   | 0.05 | 0.06  | 0.07  | 0.06                  |
Chemical composition of fresh phalsa-pear blend

The data revealed that with an increase of pear content in the blends, TSS decreased from 15.50 °Brix to 13.00 °Brix. While as per cent titratable acidity decreased from 1.66 to 0.96 per cent while as pH increased from 3.5 to 3.7. This could be due to the presence of low acidity in the pear fruit. Reducing sugar and total sugar blends also decreased from 12.10 to 10.15 per cent and 13.24 to 11.61 per cent which might be due to lesser concentration in pear juice while as the tannin content of phalsa-pear blends increased from 1.92 to 52.89 mg/100 ml. As far as ascorbic acid, anthocyanin, iron and phosphorous contents were concerned they decreased from the initials level of 8.90 to 5.88, 74.12 to 40.50, 1.05 to 0.59 and 22.20 to 18.96 mg/100 ml, this might be due to the lower concentration of ascorbic acid, anthocyanin, iron and phosphorous content in pear juice than in phalsa pulp (Table 3). These results were in accordance with the findings of Sharma (2005) and Sharma (2012) who worked on the blending of guava-papaya and jamun-mango, respectively.

Chemical composition of fresh phalsa-pear blended crush

The total soluble solids and titratable acidity of all the treatments were maintained at 55°Brix and 1.0 per cent, respectively. The highest pH (4.30) was recorded in T10 (55:45:: phalsa: pear) and T11 (50:50:: phalsa: pear) and the lowest (4.16) in T1 (100:00:: phalsa: pear). Similar results were reported by Sharma (2012) in jamun-mango squash. The highest and lowest sugars (reducing and total sugar) contents of 32.62, 43.51 and 31.69, 42.12 per cent, respectively were recorded in treatment T1 (100:00:: phalsa: pear) and T11 (50:50:: phalsa: pear). The highest ascorbic acid, anthocyanin, iron and phosphorous contents amounting to 7.38, 18.92, 0.31 and 6.87 mg/100 ml, respectively were observed in T1 (100:00:: phalsa: pear) while lowest 4.07, 10.75, 0.12 and 6.16 mg/100 ml, respectively were observed in treatment T11 (50:50:: phalsa: pear). It can be attributed to higher content of ascorbic acid anthocyanin, iron and phosphorous in phalsa fruit than in pear. The maximum and minimum tannin content of 12.11 and 0.43 mg/100 ml was recorded in T11 (50:50:: phalsa: pear) and T1 (100:00:: phalsa: pear), respectively (Table 4).

Sensory evaluation of phalsa-pear blended crush

The highest colour, body, aroma, taste and overall acceptability score of 7.72, 7.34, 7.45, 7.44 and 7.48, respectively were recorded for T5 (80:20:: phalsa: pear) while as the lowest score of 6.12, 6.12, 6.07, 6.72 and 6.25 for colour, body, aroma, taste and overall acceptability, respectively were observed by T11 (50:50:: phalsa: pear). Based on the sensory evaluation scores of different attributes, T5 (80:20:: phalsa: pear) ranked on the top and was considered the most suitable ratio for making crush (Table 5).

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References

Balaswamy, K., Rao, P. P., Nagender, A. and Satyanarayana, A. 2011. Preparation of sour grapes (Vitis vinifera) beverages and evaluation of their storage stability. Journal of Food Processing and Technology, 2: 100-116.

Elhassan, G. O. M. and Yagi, S. M. 2010. Nutritional composition of Grewia
species (Grewia tenax (Forsk) Fiori, G. flavescens Juss and G. Villosa wild) fruits. *Advanced Journal of Food Science and Technology*, 2 (3): 159-162.

Haq, M. Z., Stankovie, M. S., Rizwan, K. and De Feo, V. 2013. Phalsa (Grewia asiatica L.) food plant with multiple uses. *Molecules*, 18: 2663-2682.

Kacha, H. L., Jat, G. and Patel, S.K. 2014. Performance of various plant growth regulators on yield and quality of phalsa (Grewia asiatica L.). *Horticulture Flora Research Spectrum*, 3 (3): 292-294

Khurdiya, D. S. 1979. Nature and retention of anthocyanin pigments in phalsa (Grewia subinaequalis L.) fruit Ph. D. Thesis, IARI, New Delhi

Kohli, A. K. 1979. Studies on the production, preservation and stability of ascorbic acid of patharnakh pear juice. M.Sc. Thesis, Punjab Agricultural University (PAU), Ludhiana.

Kumar, M., Dwivedi, R., Anand, A. K. and Kumar, A. 2014. Effect of nutrient on Physico-chemical characteristics of phalsa (Grewia subinaequalis, L.) fruits. *Global Journal of Bioscience and Biotechnology*, 3 (3): 32-323.

Mahajan, B. V. C., Kumar, D. and Dhillon, W. S. 2013. Effect of different polymeric films on shelf life and quality of pear fruits under supermarket conditions. *Indian Journal of Horticulture*, 70 (2): 309-312.

Raj, D., Sharma, P. C. and Vaidya, D. 2011. Effect of blending and storage on quality characteristics of blending sand pear-apple juice beverage. *Journal of Food Science and Technology*, 48 (1): 102-105.

Rani, U. 1981. Preparation and storage of pear preserve and pear candy. M. Sc. Thesis, Punjab Agricultural University (PAU), Ludhiana.

Sharma, D. 2012. Processing of jamun (Syzygium cumini L.) into value added products. Ph.D Thesis, Division of PHT, SKUAST- Jammu, India.

Sharma, I. 2005. Preparation and evaluation of ready-to-serve beverage from guava and papaya. M. Sc. Thesis, Division of Pomology and Post-Harvest Technology, SKUAST- Jammu, India.

Tiwari, D. K., Singh, D., Barman, K. and Patel, V. B. 2014. Bioactive compounds and processed products of phalsa (Grewia subinaequalis L.) fruit. *Popular Kheti*, 2 (4): Sept-Oct.

Waskar, D. P. 1985. Processing and storage of phalsa beverages. M.Sc. Thesis, Indian Agricultural Research Institute (IARI), New Delhi.

Yadav, A. K. 1998. Phalsa: Commodity sheet FVSU-004 of the Fort Valley State University. Agriculture Research Station.

Yadav, A. K. 1999. Phalsa: A potential new small fruit for Georgia. *In: Janick, J (Ed.), Perspectives on New Crops and New uses*. ASHS, pp 348-352.

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