

# Studies on Preparation of Jamun: Pomegranate Blended Jelly

<sup>[1]</sup> V. V. Misal, <sup>[2]</sup> K. H. Pujari, <sup>[3]</sup> P. P. Relekar

<sup>[1][2]</sup> Department of Post-Harvest Management of Fruits, Vegetable and Flowers,  
Post-Graduation Institute of Post Harvest Management, Killa-Roha 402 116 Dist. Raigad.

<sup>[3]</sup> Dr. BSKKV, Dapoli, Dist. Ratnagiri

---

**Abstract-** Jamun: Pomegranate blended jelly was prepared by using various proportions of Jamun and Pomegranate fruit juices viz. 100:00, 95:05, 90:10, 85:15 and 80:20 and with 0.5 per cent level of citric acid. The Jamun: Pomegranate blended jelly was evaluated for physical, chemical and sensory quality parameters during 90 days of storage to standardize the proportion of Jamun: Pomegranate fruit juices in the blended jelly. An increasing trend in moisture and reducing sugars and total sugars, T.S.S., Titratable acidity and ascorbic acid in decreasing trend was observed during storage period of 90 days. The jelly prepared by blending Jamun and Pomegranate juices in the ratio 85:15 was found to be the best proportion for the preparation of Jamun: Pomegranate blended jelly with highest organoleptic score for colour, flavour and overall acceptability.

**Key Words:** - Jamun juice, Pomegranate juice, Blended, Storage, Jelly, Organoleptic score.

---

## I. INTRODUCTION

Jamun (*Syzygium cumini* L.) is one of the most important tropical fruit belonging to the family Myrtaceae. It is popularly known as Jambhul. It is widely grown throughout India and other tropical and sub-tropical countries. It is generally grown as an avenue tree on national highways or as a wind break tree in the fruit orchards. Its tree is large and evergreen, tends to develop umbrella like canopy, having dense foliage. The tasty and pleasant coloured jamun fruit is mostly used for table purpose. Fruits are rich source of iron apart from minerals, sugars and proteins having great nutritional and medicinal value. It is used in Ayurveda and Unani systems of medicine. Jamun fruits are known for their acidic and astringent taste and are useful for curing diarrhea, diabetes and dysentery. Seed powder of jamun also reduces the quantity of sugar in urine very quickly. It is stomachic and diuretic apart from having cooling and digestive properties. It markedly lowers the blood pressure and is used as a lotion for curing ringworms. Generally, two main types of jamun are distinguished on the basis of type of fruit. The 'Rajamun' fruit is big, oblong, deep purple or bluish black in colour having pink to greyish, juicy and sweet flesh with small seeds. The other type is known as 'Kaatha' which has small fruits with comparatively bigger seeds and flesh acidic in taste. Jamun fruit has moisture (28.2 g), carbohydrates (19.7 g), protein (0.7 g), fat (0.1 g), fibre (0.9 g), calcium (20 mg), phosphorous (10 mg), iron (1 g), anthocyanin (168 mg), and calories (83) per 100 g edible portion. Jamun fruits are mostly consumed in fresh form. The fruits are highly perishable in nature and are available only for a very short duration in June-July. The surplus fruits cannot be transported to distant markets for consumption. The spoilage

of unmarketed surplus produce can be avoided by converting it into delicious and highly refreshing beverages like RTS drink, nectar, squash, crush, syrup etc. and other value added products like jam, jelly, chutney, butter, sauce, spread, slab, bar, cheese and toffee. Value added products of jamun can also attract both national and international market because there is always a great demand from the consumers all over the world for the new food products which are nutritious, therapeutic, delicious, appetizing and brilliant in colour and appearance. Only a few researchers have done some work on this valuable fruit, hence, there is a paucity of literature on processing technology of different jamun products. Pomegranate (*Punica granatum*.L), a member of the family Punicaceae is one of the most favourite table fruits grown in tropical and subtropical regions of the world. The fruit has been extolled for its cool refreshing juice and is processed into various products such as squash, syrup, jelly, wine, Anar-rub and Anardana. Pomegranate fruits with large juicy grains may give an attractive coloured juice. Mild sweet, acid taste and low tannin contents are the desirable characteristics for processing. Pomegranate fruit can be processed to delicately flavoured RTS beverage. Further, pomegranate juice can be blended with other fruit drinks. (Kuldeep et al., 2006) Pomegranate juice is thirst quenching and is the best for patients suffering from leprosy, high cholesterol levels, heart, kidney and tuberculosis patients. The rind of the fruit possesses medicinal properties and used in indigenous system of medicines for preventing the intestinal disorders of dysentery, worms and diarrhoea. Extracts of fruit has antiviral (Polio-virus) activity (Konowalchuk and Speirs, 1976). The blending of fruit drinks could be an economic requisite to utilize, the fruits profitably, as some varieties of

fruits used for processing may not have otherwise favourable characteristics such as colour, aroma and mouth feel. Fruits, which are rich in nutrients but are not accepted due to high acidity or poor taste and flavour can be blended with other fruits to improve their acceptability and make use of available nutrients (Khan et al., 1988). Therefore blending of fruit juices for the preparation of ready to serve (RTS) beverages with the addition of spice extracts/drops as health drinks are thought to be convenient alternative for its utilization in order to have some value added drinks which are of high quality in respect of both sensory and nutritional aspects (Bidyut and Vijay Sethi, 2001). Hence, blending with Pomegranate juice may improve the nutritional quality of the Jamun: Pomegranate blended jelly cubes. Jamun used as fruit base in the preparation of blended jelly.

**II. MATERIAL AND METHODS**

The fruits required for conducting research were procured from the local market. Fresh ripe Jamun fruits were peeled and cut into small pieces with a stainless steel knife. Pomegranate were peeled and wash properly. Then, the juice was extracted by squeezing the Jamun pulp in double fold muslin cloth. The water was added in both juices in 1:1 proportion. Juices of Jamun and Pomegranate were blended in different proportions as per the treatments. The sugar was added in 1:1 proportion in the juice. After addition of the sugar, the mixture was boiled as rapidly as possible to avoid destruction of pectin as well as to maintain the colour and flavour of the jelly. The scum was removed with the help of spoon as and when it appeared. After reaching 60°B TSS it was sprinkled on the pectin extract with continuous stirring to avoid loss of jelly forming strength of pectin. Upon reaching 65 OB TSS, the citric acid was added @ 0.5 per cent and the sodium benzoate @ 200 ppm the end as a chemical preservative. The experiment comprised of five treatments.

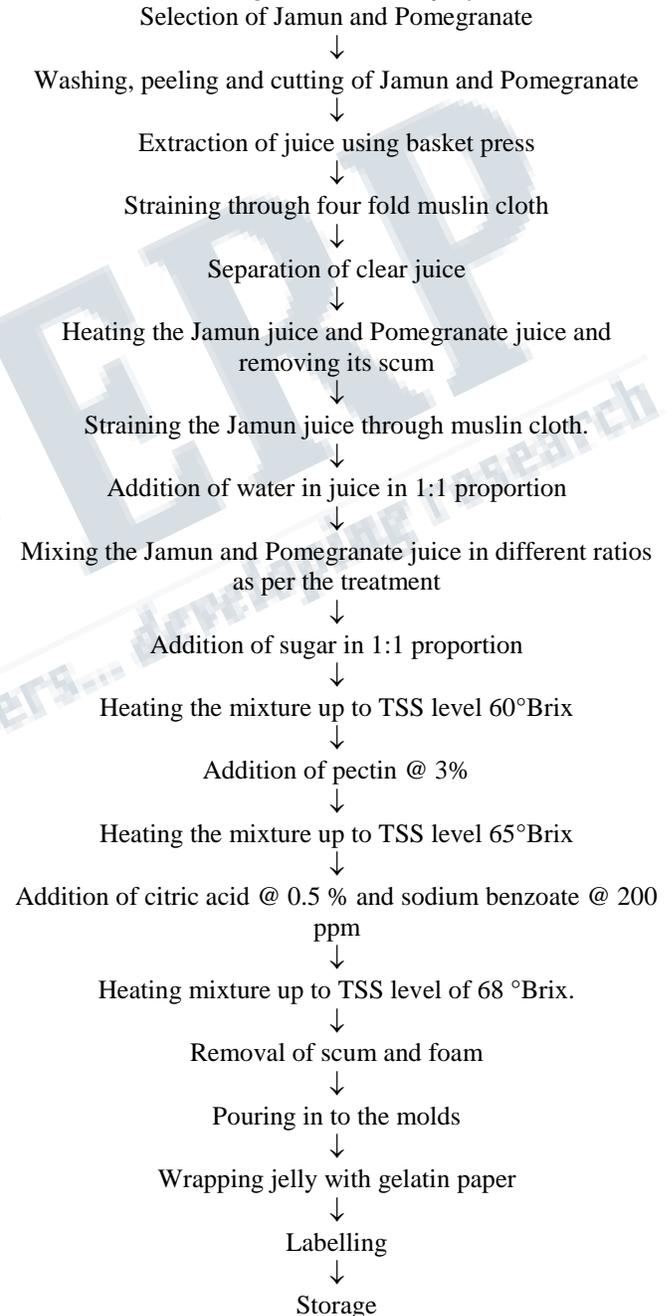
**Treatment Details**

Treatments	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>
Proportions of Jamun and Pomegranate juices	100:00	95:05	90:10	85:15	80:20

When the TSS of jelly reached to 68 °B, the blended jelly was filled hot in the pre-sterilized, wide mouthed glass bottles and capped air tight. Packaged jelly was then processed in boiling water for a period of ten minutes. The jelly was evaluated immediately after preparation and at an interval of 30 days up to 90 days of storage. Total soluble solids were determined using Hand refractrometer (Erma Japan, 0-320 Brix). Titratable acidity, reducing and total sugars were estimated by methods suggested by Ranganna (1997). The product was evaluated for their organoleptic

qualities like colour, flavour and overall acceptability on a hedonic scale (Amerine et al., 1965). The observations on various parameters were recorded with three replications. The data collected were statistically analysed by the standard procedure given by Panse and Sukhatme (1985) using Factorial Completely Randomized Design (FCRD).

**Fig. A: Flow chart for preparation of Jamun and Pomegranate blended jelly**



### III. RESULTS AND DISCUSSION

The data on the changes in moisture, TSS, acidity, reducing sugar and total sugar content of Jamun: Pomegranate blended jelly during storage is presented in Table 1 to 3. An increase in moisture content of jelly was observed during 90 days of storage. An increase in reducing sugar of jelly during storage. Similar observations were observed by Relekar et al. (2011) in Jamun jelly and Singh and Chandra (2012) in guava and carrot jelly. The titratable acidity during the storage period of 90 days showed a declining trend. This might be attributed to the chemical reactions between organic constituents of fruit induced by temperature and action of enzyme during storage Analogous observations were recorded by Tomer et al.(1988) in diabetic jelly prepared from guava and papaya extracts and Masoodi et al. (2005) in guava jelly. A significant increase in reducing sugar content of the blended jelly was found during storage period. This increase might be due to inversion of non-reducing sugars into reducing sugars acid hydrolysis of polysaccharides. Similar results were observed by Tomer et al. (1988) in diabetic jelly and Relekar et al. (2011) in Jamun jelly. Total sugars of Jamun: Pomegranate blended jelly increased significantly during storage period of 90 days. The increase in total sugar content might be due to breakdown of insoluble polysaccharide in simple sugars. Similar results were observed by Masoodi et al.(2005) in guava jelly while Relekar et al.(2011) in Jamun jelly. Among the treatments, significantly highest sensory score for overall acceptability was recorded by the treatment T4 (85:15). It was the best among all treatments and also rated the best with respect to sensory attributes like colour and flavour of the Jamun: Pomegranate blended jelly. (Table 4).

**Table 5: Effect of different proportions of Jamun and Pomegranate juices on the moisture content of blended jelly during storage**

Treatments	Moisture (%)				Mean
	Storage period (Days)				
	0	30	60	90	
T1	21.44	21.49	22.44	23.50	22.22
T2	23.22	23.66	24.10	24.88	23.97
T3	25.33	25.50	26.22	26.33	25.85
T4	26.22	26.47	26.65	26.77	26.53
T5	27.11	27.54	28.00	28.10	27.69
Mean	24.66	24.93	25.48	25.92	
		<b>S.Em ±</b>		<b>CD at 5%</b>	
<b>Treatments (T)</b>		0.033		0.096	
<b>Storage (S)</b>		0.037		0.10	
<b>Interaction (T×S)</b>		0.065		0.18	

**Table 6: Effect of different proportions of Jamun and Pomegranate juices on the total soluble solid content of blended jelly during storage**

Treatments	Total soluble solids (°B)				Mean
	Storage period (Days)				
	0	30	60	90	
T1	69.00	69.75	70.75	70.88	70.10
T2	68.63	69.13	69.38	70.13	69.31
T3	68.50	68.88	69.38	69.88	69.16
T4	68.38	68.60	69.25	69.60	68.95
T5	68.00	68.50	68.62	66.75	68.47
Mean	68.50	68.97	69.48	69.81	
		<b>S.Em ±</b>		<b>CD at 5%</b>	
<b>Treatments (T)</b>		0.17		0.49	
<b>Storage (S)</b>		0.19		0.55	
<b>Interaction (T×S)</b>		0.33		NS	

**Table 7: Effect of different proportions of Jamun and Pomegranate juices on the titratable acidity of blended jelly during storage.**

Treatments	Titratable acidity (%)				Mean
	Storage period (Days)				
	0	30	60	90	
T1	0.55	0.50	0.47	0.41	0.49
T2	0.56	0.53	0.49	0.43	0.50
T3	0.57	0.53	0.49	0.43	0.50
T4	0.57	0.54	0.52	0.44	0.51
T5	0.59	0.56	0.53	0.46	0.54
Mean	0.57	0.53	0.50	0.43	
		<b>S.Em ±</b>		<b>CD at 5%</b>	
<b>Treatments (T)</b>		0.002		0.007	
<b>Storage (S)</b>		0.003		0.008	
<b>Interaction (T×S)</b>		0.005		NS	

**Table 8: Effect of different proportions of Jamun and Pomegranate juices on reducing sugar content of blended jelly during storage**

Treatments	Reducing sugars (%)				Mean
	Storage period (Days)				
	0	30	60	90	
T1	27.80	29.07	29.10	30.83	29.20
T2	29.02	29.18	29.54	30.16	29.48
T3	30.30	30.35	30.81	32.40	30.96
T4	30.41	31.26	31.53	32.28	31.37
T5	31.11	31.29	31.90	32.57	31.72
Mean	29.73	30.23	30.58	31.65	
		<b>S.Em ±</b>		<b>CD at 5%</b>	
<b>Treatments (T)</b>		0.11		0.32	
<b>Storage (S)</b>		0.12		0.36	
<b>Interaction (T×S)</b>		0.22		0.62	

**Table 9: Effect of different proportions of Jamun and Pomegranate juices on total sugar content of blended jelly during storage**

Treatments	Reducing sugars (%)				Mean
	Storage period (Days)				
	0	30	60	90	
T1	27.80	29.07	29.10	30.83	29.20
T2	29.02	29.18	29.54	30.16	29.48
T3	30.30	30.35	30.81	32.40	30.96
T4	30.41	31.26	31.53	32.28	31.37
T5	31.11	31.29	31.90	32.57	31.72
Mean	29.73	30.23	30.58	31.65	
		<b>S.Em ±</b>		<b>CD at 5%</b>	
<b>Treatments (T)</b>		0.11		0.32	
<b>Storage (S)</b>		0.12		0.36	
<b>Interaction (T×S)</b>		0.22		0.62	

**Table 10: Effect of different proportions of Jamun and Pomegranate juices on ascorbic acid content of blended jelly during storage**

Treatments	Ascorbic acid (mg/100g)				Mean
	Storage period (Days)				
	0	30	60	90	
T1	7.81	6.26	5.23	4.42	5.93
T2	7.09	6.21	5.45	4.25	5.75
T3	6.29	5.40	4.15	3.22	4.77
T4	5.21	4.42	3.29	2.94	3.97
T5	4.07	3.17	3.07	2.19	3.13
Mean	6.10	5.09	4.24	3.40	
		<b>S.Em ±</b>		<b>CD at 5%</b>	
<b>Treatments (T)</b>		0.025		0.072	
<b>Storage (S)</b>		0.028		0.081	
<b>Interaction (T×S)</b>		0.049		0.13	

**Table 12: Effect of different proportions of Jamun and Pomegranate juices on sensory score for colour of blended jelly during storage**

Treatments	Sensory score for colour				Mean
	Storage period (Days)				
	0	30	60	90	
T1	6.50	6.00	6.00	6.00	6.13
T2	6.50	6.30	6.00	6.00	6.20
T3	7.00	7.10	6.50	6.00	6.65
T4	7.50	7.30	6.50	6.10	6.84
T5	8.00	7.50	7.00	6.50	7.25
Mean	7.10	6.83	6.40	6.12	
		<b>S.Em ±</b>		<b>CD at 5%</b>	
<b>Treatments (T)</b>		0.021		0.061	
<b>Storage (S)</b>		0.023		0.068	
<b>Interaction (T×S)</b>		0.041		0.11	

**Table 13: Effect of different proportions of Jamun and Pomegranate juices on sensory score for flavour of blended jelly during storage**

Treatments	Sensory score for flavour				Mean
	Storage period (Days)				
	0	30	60	90	
T1	7.50	7.00	6.25	6.00	6.69
T2	7.00	6.75	6.38	6.25	6.60
T3	8.00	7.50	6.50	6.00	7.00
T4	8.50	7.50	7.00	6.50	7.38
T5	6.75	6.25	6.13	6.00	6.28
Mean	7.55	7.40	6.45	6.15	
		<b>S.Em ±</b>		<b>CD at 5%</b>	
<b>Treatments (T)</b>		0.042		0.12	
<b>Storage (S)</b>		0.047		0.13	
<b>Interaction (T×S)</b>		0.082		0.23	

**Table 14: Effect of different proportions of Jamun and Pomegranate juices on sensory score for texture of blended jelly during storage**

Treatments	Sensory score for texture				Mean
	Storage period (Days)				
	0	30	60	90	
T1	7.25	6.75	6.25	6.00	6.56
T2	7.00	6.50	6.25	6.00	6.44
T3	8.00	7.25	6.75	6.25	7.06
T4	8.25	8.00	7.00	6.50	7.44
T5	6.50	6.25	6.00	6.00	6.19
Mean	7.40	6.95	6.45	6.15	
		<b>S.Em ±</b>		<b>CD at 5%</b>	
<b>Treatments (T)</b>		0.064		0.18	
<b>Storage (S)</b>		0.072		0.20	
<b>Interaction (T×S)</b>		0.12		0.35	

**Table 15: Effect of different proportions of Jamun and Pomegranate juices on sensory score for overall acceptability of blended jelly during storage**

Treatments	Sensory score overall acceptability				Mean
	Storage period (Days)				
	0	30	60	90	
T1	7.09	6.59	6.17	6.00	6.46
T2	6.84	6.52	6.21	6.09	6.42
T3	7.67	7.29	6.59	6.09	6.91
T4	8.09	7.59	6.84	6.37	7.22
T5	6.99	6.67	6.37	6.17	6.55
Mean	7.34	6.93	6.44	6.14	
		<b>S.Em ±</b>		<b>CD at 5%</b>	
<b>Treatments (T)</b>		0.027		0.077	
<b>Storage (S)</b>		0.030		0.087	
<b>Interaction (T×S)</b>		0.052		0.14	

#### IV. CONCLUSION

From the present investigation, it could be concluded that, the colour, flavour and texture of the jelly retained after 90 days of storage period and the jelly was acceptable even after 90 days of storage at ambient conditions. The jelly prepared by blending Jamun and Pomegranate juice in the ratio 85:15 with 0.5 per cent acidity and 0.5 per cent pectin content was found to be the best treatment with highest organoleptic score for overall acceptability.

#### REFERENCES

1. A.O.A.C. (1975). Official methods of analysis. Association of official analytical chemists, Washington D.C., USA.
2. Amutha. (2014). An Analysis of Jamun fruit cultivation in Tuticorin district International Journal of Economics and Management Science, 3 (4):1-4.
3. Abozeid, W. M. and Nadir, A. S. (2012). Physicochemical and organoleptic characteristics of loquat fruit and its processing. Nature and science. 10 (6): 108-113.
4. Aleman, S., Pacheco-Delahaye, E., Perez, E. and Schroeder, M. (2011). Elaboration of blackberry (*Rubus glaucus* Benth) jellies with native and modified banana starches (*Musa ABB*). African Journal of Food Science, 5(4): 181-187.
5. Amerine, M.A., Pangborn, R.M. and Rosseler, E.B. (1965). Principles of sensory evaluation of foods. Academic press. New York, pp: 350-376.
6. Carvalho, V.S., Damiani, C., Asquieri, E.R., Orsi, D.C. and Faustino N.A.C. (2012). Development and antioxidant capacity of Jamun pulp jelly. Cienc. Agrotech. Lavras, 36(3): 341-347.
7. Chaudhari S.N and Nikam .M.P. (2013). Development and Sensory analysis of Pomegranate jelly International journal of science and Research, 4 (10):1-4, October 2015.
8. Deen, B. and Singh I.S. (2013). Studies on preparation and storage of jelly from karonda fruits. Beverage and Food World, 40 (1): 60-64.
9. Dambalkar V. S., Rudrawar B. D., Poojari V. R. (2015). Study of physico-chemical properties and sensory attributes of Pomegranate-Orange RTS drink. International Journal of Science and Research (IJSR), 4(10):589-592.
10. Gautam, S.K., and Chundawat B.S. (1998). Standardization of technology of Jamun wine making. Indian Food Packer, 52(1): 17-21.
11. Ghade, P. P, (2013). Studies on Jamun: papaya blended jelly. M.Sc. (Post-harvest management) thesis submitted to the Post Graduate Institute of Post-Harvest Management, Killa-Roha, Dist. Raigad, Maharashtra.
12. Hiremath, J.B. and Rokhade, A.K. (2012). Preparation and preservation of Jamun juice. Int. J. Fd. Agri. Vet. Sci., 2(1): 87-91.
13. Hossen, S., Kabir, M. S. Uddin, M. B., Rahman A. K. M. L. and Mamun, M. R. A. (2009). Effect of different extraction of juice on quality acceptability of guava jelly. J. Innov. Dev. Strategy, 3(4): 27-35.
14. Jumde ankush and shukla, Gousoddin. (2015). Development and chemical analysis of watermelon blends with Pomegranate juice during storage, 3(4):960-962.
15. Kiiyukia, C. (2003). Laboratory manual of food microbiology for Ethiopian health and nutrition research institute. 11-52.
16. Katoch, S., Kalia, M. and Singh V. (2006). Product development of seabuckthorn with apple and guava fruits vis-a-vis their feasibility. J. Fd. Sci. Technol., 43(5): 532-534.
17. Lane, J.H. and Eynon, L. (1923). Methods for determination of reducing and non-reducing sugars. Journal of Science, 42: 32-37.
18. Masoodi, A.A., Sapra V. and Bakshi P. (2005). Use of tomato and carrot as biocolourants in guava jelly. Indian Fd. Packer, 59: 87-90.
19. Miguel, A. C. A., Albertini, S. and Spoto, M. H. F. (2008). Geleizada degradation kinetics of strawberries. Science and Food Technology, Campinas, 29(1): 142-147.

**International Journal of Science, Engineering and Management (IJSEM)**
**Vol 3, Issue 4, April 2018**

20. Moura, S.C.S.R., Prat, P., Vissotto, F.Z., Rita, C.S.C.O. and Marina, S.R. (2011). Colour degradation kinetics in low-calorie strawberry and guava jellies, *Cienc. Tecnol. Aliment, Campinas*, 31(3): 758-764.
21. Manjunatha, S.S. and Raju, P.S. (2015). Rheological characteristics of reconstituted spray dried Pomegranate (*Beta vulgaris L.*) juice powder at different solid content, temperatures and carrier materials, *International Food Research Journal*, 22(6): 2333-2345.
22. Ochoa-Martinez LA, Garza-Juarez, Rocha-Guzman, Morales-Castro J, Gonzalez-Herrera SM (2015). Functional Properties, Colour and Betalain Content in Pomegranate-Orange Juice Powder Obtained by Spray Drying, 3(2):20-34.
23. Panase, V. G and P. V. Sukhatme (1985). *Statistical methods for Agricultural workers*, I.C.A.R New Delhi.
24. Pawar, C. D., Patil, A. A. and Joshi, G. D. (2011). Physico-chemical parameters of Jamun fruits at different maturity stages, *Karnataka J. Agric. Sci.*, 24 (3): 420-442.
25. Patil. D. (2013). Studies on preservation of Pomegranate (*Beta vulgaris*) juice. M.Sc. (Post-harvest management) thesis submitted to the Post Graduate Institute of Post-Harvest Management, Killa-Roha, Dist-Raigad, and Maharashtra.
26. Pawar, V. C., (2013). Studies on preparation of blended jam of Jamun: papaya. M.Sc. (Post-harvest management) thesis submitted to the Post Graduate Institute of Post-Harvest Management, Killa-Roha, Dist-Raigad, and Maharashtra.
27. Poonam A., Padda, G. S. and Sidhu, J. S. (1997). Standardization of jelly preparation from Grape: Guava blends. *J. Food Sci. Technol.*, 34 (4): 335-336.
28. Rababah, T. Muhammad Al-u'datt, Ali, A., Susan, B., Hao F., Majdi Al-Mahasneh, Khalil, E. and Wade Y. (2012). Evaluation of nutraceutical, physiochemical and sensory properties of raisin jam. *Journal of Food Science*, 77 (60): 609-613.
29. Ranganna S. (2003). *Handbook of analysis and quality control for fruits and vegetable products*. Tata McGraw-Hill Publishing Company Limited. New Delhi. Pp 11-12.
30. Relekar, P. P., Naik, A. G. and Padhiar, B. V. (2011). Qualitative changes in value added products of Jamun Cv. kalipatti during storage. *Indian journal of horticulture*, 68(3): 431-418.
31. Reddy Meghana and Dr. D. Annette Beatrice and Dr. V Bhavani. (2013). Sensory and microbial quality of newly developed fermented Pomegranate beverage. *World journal of pharmacy and pharmaceutical sciences*. 3(1): 361-367.
32. Safdar, M. N., Mumtaz, A. T., Hameed, T., Siddiqui, N., Khalil, S. and Amjad, M. (2012). Storage studies of jam prepared from different mango varieties. *Pakistan Journal of Nutrition*, 11(7): 555-561.
33. Sawant V.S. (1989). Studies on post-harvest handling and preservation of Jamun (*Manilkara achras* (Mill) Forsberg) fruit Cv. Kalipatti. M.Sc. (Agri.) Thesis, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli (India).
34. Shakir, I., Hussain, I., Zeb, A. and Durrani, Y. (2009). Sensory evaluation and microbial analysis of apple and pear mixed fruit jam prepared from varieties grown in Azad Jammu and Kashmir. *World Journal of Dairy & Food Sciences*, 4(2): 201-204.
35. Singh, J. and Chandra S. (2012). Preparation and evaluation of guava-carrot jelly. *Intl. J. of Food. Ferment. Technol.*, 2(2): 197-200.
36. Tomar, M. C., Srivastava, R. K. and Bisht, N. S. (1988). Studies on the preparation and the effect of diabetic jelly on blood sugar. *Indian Fd. Packer*, 40: 10-14.
37. Yahia and Gutierrez (2011). Sapodilla (*Manilkara achras* (Mill) Fosb, syn *Achras Jamun L.*), 352-360.