



Effect of Levels of Maltodextrin on Spray Dried Jamun Juice Powder on Its Recovery and Sensory Quality

A.R.Kamtekar^{1*}, K.H. Pujari², M. S. Masal³, P.H.Kambekar⁴

Department of Post Harvest Management of Fruit, vegetable and Flower Crops, Post Graduate Institute of Post Harvest Management, Killa-Roha, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli-415712 (Maharashtra)

ABSTRACT

The present investigation entitled, "Effect of levels of maltodextrin on spray dried jamun juice powder on its recovery and sensory quality" was undertaken at the Department of Post harvest Management of Fruit, Vegetables, and Flower Crops, Faculty of Post Harvest Management, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Dist- Ratnagiri during the year 2012-2014. The experiment was conducted in F.C.R.D. with four factors viz., maltodextrin levels (10%, 15%, 20% and 25%) and storage period (0, 30, 60, and 90 days). Based on the overall acceptability the addition of maltodextrin @ 10 and 15 per cent proved to be suitable for the production of produce high quality of spray dried jamun juice powder.

Key words : Jamun powder, Maltodextrin, Tricalcium phosphate, spray dryer

Received 18.07.2017

Revised 09.08.2017

Accepted 24.08.2017

INTRODUCTION

Jamun is one of the most popular fruits of India grown throughout the country except high hills. The konkan region comprising of Thane, Raigad, Ratnagiri and Sindhudurg districts of Maharashtra state has also peculiar geographical and socio economic conditions suitable for production of neglected minor fruit crops which can be successfully grown on the hilly terrains of the konkan region. Jamun fruit is full of medicinal properties; it has antioxidants, antibacterial, polyphenols, cardiovascular properties, so it is called medicinal fruit. Jamun fruits are universally accepted to be very good for medicinal purpose especially for curing diabetes because of its effect on the pancreas (Joshi, 2001). Considering the excellent processing qualities of pulp of jamun fruit are extensively used for the preparation of preserves, squashes, jellies, wine, vinegar, juice etc. (Nawaz, 2010). Good quality of jamun juice is excellent for sherbet, syrup and squash (Miller *et al.*, 1955). Maltodextrin added in the pulp to reduce sticking of powder on the wall of cyclone spray dryer. The maltodextrin was used as aid for spray drying of fruit powder. Jamun is a scattered plantation and jamun fruits are mostly harvested in rainy season. Hence processing is essential. It is used for making delicious beverages, jam, jellies, jam, squash, wine, vinegar and pickles. Preparation of jamun juice powder is new dimension in processing sector used in preparation of instant RTS. Therefore present investigation entitled "Effect of levels of maltodextrin on spray dried jamun juice powder on its recovery and sensory quality"

MATERIAL AND METHODS

The present investigation entitled, "Effect of levels of maltodextrin on spray dried jamun juice powder on its recovery and sensory quality" was conducted at the Department of Post Harvest Management of Dr. Balasaheb Konkan Krishi Vidyapeeth, Dapoli. This experiment was laid out in factorial completely randomized design with four replications each comprising of four treatments and four storage period such as-

T₁ – 10% Maltodextrin level

T₂ – 15% Maltodextrin level

T₃ – 20% Maltodextrin level

T₄ – 25% Maltodextrin level

- S1- 0 day
- S2- 30 days
- S3- 60 days
- S4- 90 days

The fully mature, healthy and uniformly ripened jamun fruits were collected from local market. Juice was extracted from by using pulper machine. The extracted juice was clarified manually by using muslin cloth and sodium benzoate was added as a preservative and juice was kept in food grade plastic cans.

The maltodextrin was added in the juice @ of 10, 15, 20, and 25 per cent The juice was homogenised thoroughly by using mixer grinder and later on use on preparation of powder. The spray dryer model no. SPD-D-111 (Technosearch lab india) was used for preparation of jamun juice powder. The schematic diagram of the spray dryer was shown in fig 1.

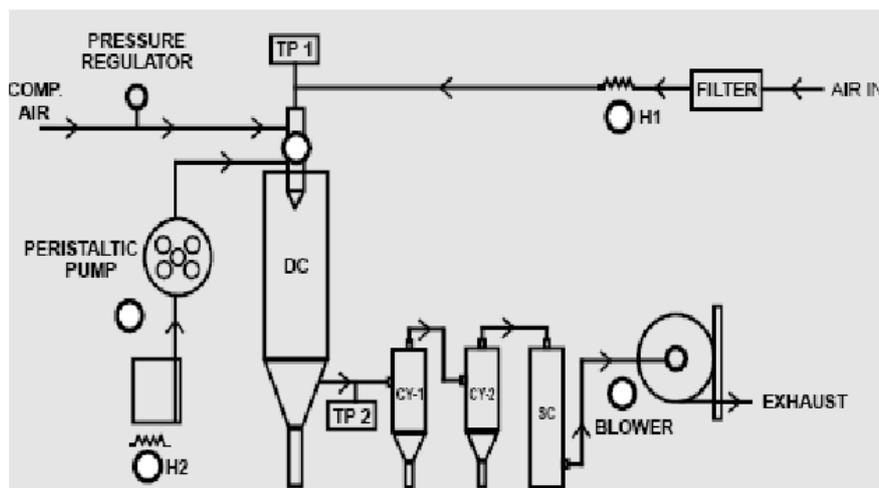


Figure1. A schematic diagram of spray dryer

- | | | |
|-----------|---|------------------|
| F | - | Filter |
| DC | - | Drying chamber |
| CY | - | 1 and 2 Cyclones |
| SC | - | Scrubber |
| H1 and H2 | - | Heater |
| P | - | Feed pump |
| AG | - | Agitator |
| C1 and C2 | - | Collection pots |
| ASP | - | Aspirator motor |

Immediately after spray drying powder was packed in multilayer aluminium pouches for further study. The percent recovery of powder was calculated based on the total weight of juice. The RTS was prepared from jamun juice powder and its sensory qualities were evaluated by panel of five experts with a score on 9 point hedonic scale, (Amerine *et al*,1965). The data obtained for the experiment were analyzed statistically as per the method suggested by Panse and Sukhatme (1985).

RESULTS AND DISCUSSION

The data with respect to the recovery percentage of jamun juice powder is shown in Table 1. It was observed from the data that the per cent recovery of spray dried jamun juice powder showed an increasing trend with increase in the levels of maltodextrin in the jamun juice. The treatment T₄ i.e. 25 per cent maltodextrin recorded the maximum recovery (28.95%) which was highest among the treatments and the lowest recovery (19.80 %) was obtained in T₁ (10 % maltodextrin). High powder recovery values were due to addition of maltodextrin content maximum recovery of sprat dried pineapple powder was associated with maltodextrin levels greater than 15 per cent Weerachet *et al* (2009). Similar reports were also reported by Dhutade (2012) in sapota juice powder, Khanvilkar (2012) in cashew apple juice powder, Kshirsagar (2012) in kokum juice powder, Patade (2013) in coconut milk powder and Poskar (2013) in Aonla juice powder.

The RTS was prepared from jamun juice powder and organoleptically tasted during storage period of 90 days. The RTS prepared from jamun juice powder with different levels of maltodextrin was quite acceptable not only at the time of preparation, but also throughout the storage period of 90 days. It is

observed from Table 2 that the mean colour rating of jamun juice powder varied significantly due to the treatments and storage period. The treatment T₁ scored highest mean score (7.63) and it was significantly superior to rest of the treatments. The treatment T₄ recorded lowest mean score (6.88) for colour which was at par with the treatment T₃. The low acceptance value for colour of RTS jamun juice powder might be due to increasing levels of maltodextrin and also might be due to oxidation of colour pigments during storage period. Similar observations were also recorded by Patade (2013) in coconut milk powder.

From the data, it was observed from Table 3 that the that the mean value of flavour of RTS prepared from jamun juice powder varied significantly due to treatment and storage period. The treatment T₁ scored highest (7.00) rating and was significantly superior to rest of the treatments. The treatment T₄ recorded lowest (5.98) score for flavour of the product. This clearly indicates that the higher levels of the maltodextrin adversely affected the flavour of RTS prepared from jamun juice powder. It is obvious from the data that the sensory score for flavour was decreased with the advancement of storage period. Storage affected the flavour of powder due to maltodextrin content in it. A gradual decrease in flavour score during storage is reported by Patade (2013) in their studies on spray drying of coconut milk powder using maltodextrin as an adjunct.

It was observed from Table 4 that the treatment T₁ rated highest (8.41) with respect to the texture of the product and was significantly superior over to rest of the treatments. The treatment T₄ recorded lowest (7.01) score for texture of the RTS prepared from jamun juice powder. The jamun juice powder was hygroscopic in nature. The low acceptance value for texture of RTS prepared from jamun juice powder was due to increasing moisture content during storage. The gradual decrease in texture score during storage is reported by Khanvilkar (2012), in spray dried cashew apple juice.

SUMMARY AND CONCLUSION

The per cent recovery of spray dried jamun juice powder exhibited an increasing trend with rise in the maltodextrin level. The treatment T₄ showed highest (28.95 %) recovery percentage and the lowest (19.80 %) by the treatment T₁. However on the basis of sensory quality maltodextrin @ 10 and 15 per cent would be recommended for the preparation of high quality spray dried jamun juice powder.

REFERECES

1. Amerine, M. A., Pangborn, R.M. and Rosseler, E.B., 1965. Principles of Sensory Evaluation of foods. Academic Press. New York., pp: 350-376.
2. Dhutade, P.R., (2012), Studies on standardization of sapota (*Manilkaraarchras (mill) Foseberg*) Juice powder *MSc.(PHM) Thesis*, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. Dist. Ratnagiri. Maharashtra.
3. Khanvilkar A.N., 2012, Studies on standardization of cashew apple (*Anacardium occidentale L.*) Juice powder *M.Sc.(PHM) Thesis*, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. Dist. Ratnagiri. Maharashtra.
4. Kshirsagar S.V., 2012, Studies on standardization of kokum (*Garcinia indica choisy.*) Juice powder *M.Sc. (PHM) Thesis*, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. Dist. Ratnagiri. Maharashtra.
5. Joshi, S.G. (2001). Medicinal plants, New Delhi, Oxford and IBH Publishing Co.
6. Miller, C.D., Bazore K and Bartow M. (1955).Fruits of Hawaii.2nd ed. Univ. of Hawaii Press.
7. Nawaz, M.S. (2010). Determination of mineral elements in Jamun fruit (*Eugenia jambolana*) products.*Pakistan J. of Food Sci.*, **20**,: 1-7.
8. Panse, V.S. and Sukhatme, P.V., 1967. Statistical Methods for Agricultural Workers, I.C.A.R., New Delhi. pp: 70-72.
9. Patade, B.S., 2013 Studies on standardization of coconut (*Cocos nucifera L.*) milk powder *MSc.(PHM) Thesis*, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. Dist. Ratnagiri. Maharashtra.
10. Poskar, R.L., (2013), Studies on preparation of spray dried aonla (*Emblica officinalis Gaertn.*) juice powder *MSc.(PHM) Thesis*, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. Dist. Ratnagiri. Maharashtra.
11. Weerachet Jittanit, Siriwan Niti-Att and Onuma Techanuntachaikul, 2010. Study of Spray Drying of Pineapple Juice Using Maltodextrin as an Adjunct. *Chaing Mai J. Sci.*, **37**(3): 498-506.

CITATION OF THIS ARTICLE

A.R.Kamtekar, K.H. Pujari, M. S. Masal, P.H.Kambekar. Effect of Levels of Maltodextrin on Spray Dried Jamun Juice Powder on Its Recovery and Sensory Quality. *Bull. Env. Pharmacol. Life Sci.*, Vol 6 Special issue 2, 2017: 48-50