



EFFECT OF DRYING METHODS ON PROXIMATE ANALYSIS OF AONLA POWDER DURING STORAGE

Shalini^{1,2,*}, Jaivir Singh¹, Samsher¹, Suresh Chandra¹, Vivak Kumar¹,
Neelesh Chauhan¹ and Manoj Kumar Yadav³

¹Department of Agricultural Engineering, SVPUAT, Meerut, UP, India

²Directorate of Agricultural Marketing and Foreign Trade, Lucknow, UP, India

³Department of Agricultural Biotechnology, SVPUAT, Meerut, UP, India

Abstract

Effect of Drying methods i.e., Hot air dryer and Osmo - air drying at 60°C and 70°C, giving pretreatments blanching and Blanching + sulphiting on Proximate Analysis of Aonla Powder during 180 days of Storage at room temperature were investigated. Dehydration is the preferred method to preserve the fruits from the ancient time, which reduces the cost of managing, packaging, storage and transportation. Main aim is the reduction of water to the level (5-9%) at which microbial growth and deterioration reactions are minimized. The values of phosphorus were lower in blanched and blanching + sulphating aonla powder as compared to the values in controlled aonla powder. However, the values of Ash content were higher in blanching + sulphating aonla powder as compared to the values in controlled aonla powder at all 60°C and 70°C temperatures.

Keywords: Blanching, Osmo - air drying, Aonla Powder and Phosphorus.

Introduction

Aonla has played an important therapeutic role since time immemorial and is frequently recommended for its synergistic effects in both the ayurvedic and unani systems of medicine (Jain *et al.*, 1983). Being a very rich source of vitamin C and other nutrients like polyphenols, pectin, iron, calcium and phosphorous (Nath *et al.*, 1992 and Khopde *et al.*, 2001), the fruit is a potent antioxidant, hypolipidemic, antibacterial, antiviral and antacid. However like other tropical fruit amla has a short shelf life as fruit is sensitive to bruises, browning, desiccation and various post-harvest diseases. Moreover the fresh amla fruit is highly acidic and astringent; it is not popular as table fruit. Amla has a great potential in processed forms (Tripathi *et al.*, 1988).

Osmotic dehydration generally would not give a product of a low enough moisture content to be considered shelf stable. Consequently osmosed product should be further processed (generally by air, freeze and vacuum drying methods) to obtain shelf stable product. Chandra and Samsher (2002) worked on the quality of dehydrated oyster mushroom (*Pleurotus flabellatus*) as influenced by various pretreatment and drying methods. Mushroom samples pretreated with combination of blanching and steeping in KMS (0.5%) and citric acid (0.25%) solution and dried in tray drier rated highest sensory score for color, texture, flavor, and overall acceptability followed by polyhouse, sun and vacuum drying.

Material and Methods

Studies were carried out to evaluate the Ash Content and Phosphorus content of the Aonla powder prepared using Mature aonla fruits, variety 'Banarasi' under the drying

process by Hot air dryer and Osmo - air drying at 60°C and 70°C, giving pretreatments blanching and Blanching + sulphiting. The experiments were conducted in the Department of Agricultural Engineering and Food Technology, S.V.P. University of Agriculture and technology, Meerut.

Storage of dried aonla powder

Aonla powder prepared after dehydration by different methods was packed in 300 gauge polythene bags. Packets of 100gm powder was prepared these packets was wrapped in brown paper and stored in room at room temperature for a period of 0,30, 60, 90, 120, 150 and 180 days.

Results and Discussion

In hot air drying, the ash for the sample held at 60°C temperature, and stored for 0, 30, 60, 90, 120, 150, and 180 days respectively was found to be in the range of 2.01 to 1.88 % for controlled (C), 2.15 to 2.02 % for blanched (B) and 2.26 to 2.14 % for blanching + sulphating (B+S). It was observed that the lowest ash 2.01 % was found for the controlled held at 60°C for 180 days of storage period and highest ash 2.26 % was found for the blanching + sulphiting held at 60°C before storage (initial stage of storage). The variations in ash with storage period are shown in Fig 1.

In osmo- air drying, the ash for the sample held at 60°C temperature, and stored for 0, 30, 60, 90, 120, 150, and 180 days respectively was found to be in the range of 0.31 to 0.23 % for controlled, 0.34 to 0.26 % for blanched, and 0.39 to 0.32 % for blanching + sulphiting. It was observed that the highest ash 0.39 % was found for the blanching+ sulphiting held at 60°C for 180 days of storage period and lowest ash 0.31 % was

*Corresponding author Email: shalini.pundhir12@gmail.com

found for the controlled held at 60°C before storage (initial stage of storage). The variations in ash with storage period are shown in Fig 2.

In hot air drying, the ash for the sample held at 70°C temperature, and stored for 0, 30, 60, 90, 120, 150, and 180 days respectively was found to be in the range of 1.90 to 1.79 % for controlled, 2.03 to 1.93 % for blanched, and 2.15 to 1.95 % for blanching + sulphiting. It was observed that the highest ash 2.15 % was found for the blanching + sulphiting held at 70°C for 180 days of storage period and lowest ash 1.9 % was found for the controlled held at 70°C before storage (initial stage of storage). The variations in ash with storage period are shown in Fig 3.

In osmo- air drying, the ash for the sample held at 70°C temperature, and stored for 0, 30, 60, 90, 120, 150, and 180 days respectively was found to be in the range of 0.27 to 0.21 % for controlled, 0.30 to 0.24 % for blanched, and 0.34 to 0.28 % for blanching + sulphiting. It was observed that the highest ash 0.34 % was found for the blanching+ sulphiting held at 70°C for 180 days of storage period and lowest ash 0.27 % was found for the controlled held at 70°C before storage (initial stage of storage). The variations in ash with storage period are shown in Fig 4.

Phosphorus

In hot air drying, the phosphorus for the sample held at 60°C temperature, and stored for 0, 30, 60, 90, 120, 150, and 180 days respectively was found to be in the range of 70.16 to 69.31 % for controlled, 68.67 to 67.68 % for blanched, and 66.71 to 65.71 % for blanching + sulphiting. It was observed that the highest phosphorus 70.16 % was found for the controlled held at 60°C for 180 days of storage period and lowest phosphorus 66.71 % was found for the blanching + sulphiting held at 60°C before storage (initial stage of storage). The variations in phosphorus with storage period are shown in Fig 5.

In osmo- air drying, the phosphorus for the sample held at 60°C temperature, and stored for 0, 30, 60, 90, 120, 150, and 180 days respectively was found to be in the range of 65.74 to 65.11 % for controlled, 64.66 to 64.15 % for blanched, and 63.81 to 63.20 % for blanching + sulphiting. It was observed that the lowest phosphorus 63.81 % was found for the blanching+ sulphiting held at 60°C for 180 days of storage period and highest phosphorus 65.74 % was found for the controlled held at 60°C before storage (initial stage of storage). The variations in phosphorus with storage period are shown in Fig 6.

In hot air drying, the phosphorus for the sample held at 70°C temperature, and stored for 0, 30, 60, 90, 120, 150, and 180 days respectively was found to be in the range of 68.45 to

67.00 % for controlled, 66.90 to 65.80 % for blanched, and 64.37 to 62.85 % for blanching + sulphiting. It was observed that the lowest phosphorus 64.37 % was found for the blanching + sulphiting held at 70°C for 180 days of storage period and highest phosphorus 68.45 % was found for the controlled held at 70°C before storage (initial stage of storage). The variations in phosphorus with storage period are shown in Fig 7.

In osmo- air drying, the phosphorus for the sample held at 70°C temperature, and stored for 0, 30, 60, 90, 120, 150, and 180 days respectively was found to be in the range of 63.79 to 62.78 % for controlled, 62.31 to 61.55 % for blanched, and 61.45 to 60.00 % for blanching + sulphiting. It was observed that the lowest phosphorus 61.45 % was found for the blanching+ sulphiting held at 70°C for 180 days of storage period and highest phosphorus 61.45 % was found for the controlled held at 70°C before storage (initial stage of storage). The variations in phosphorus with storage period are shown in Fig 8.

Conclusion

The values of phosphorus were lower in blanched and blanching + sulphating aonla powder as compared to the values in controlled aonla powder. However, the values of Ash content were higher in blanching + sulphating aonla powder as compared to the values in controlled aonla powder. The minimum moisture content was found for osmo-air dried aonla and increased during storage.

References

- Chandra S and Samsher (2002). Studies on quality of dehydrated oyster mushroom (*Pleurotus Flabellatus*) as influenced by various pretreatment and drying methods. *Mushroom research*; **11(2)**: 107-112.
- Jain SP, Tripathi VK, Ram HB and Singh S (1983). Optimum stage of maturity for preservation of amla preserve. *Indian Food Pac.*, **37(6)**: 85-90.
- Khopde SM, Priyadarshani KI, Amohan H, Gawandi VB, Satav JG, Yakshmi JV, Banavaliker MM, Biyani MK and Mittal JP (2001). Characterizing the antioxidant activity of amla (*Phyllanthus Emblica*) extract. *Current Sci.*, **81(2)**: 185.
- Nath V, Singh IS, Kumar S and Pandey AK (1992). Effects of post harvest treatments on shelf life of aonla fruits. *Prog. Hort.*, **24**: 74-82.
- Tripathi VK, Singh MB and Singh S (1988). Studies on comparative compositional changes in different preserved products of amla (*Emblica officinalis* Gaertn.) var. banarasi. *Indian Food Pac.*, **42(4)**: 60-66.

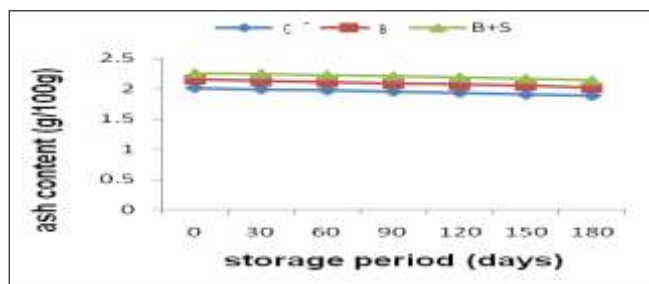


Fig 1: Effect of storage period on ash content (g/100g) of aonla powder at 60°C under hot air dryer

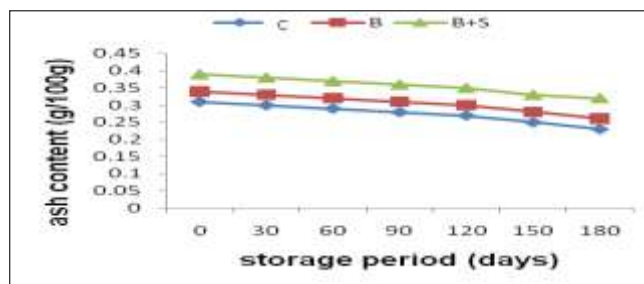


Fig 2: Effect of storage period on ash content (g/100g) of aonla powder at 60°C under osmo-air drying

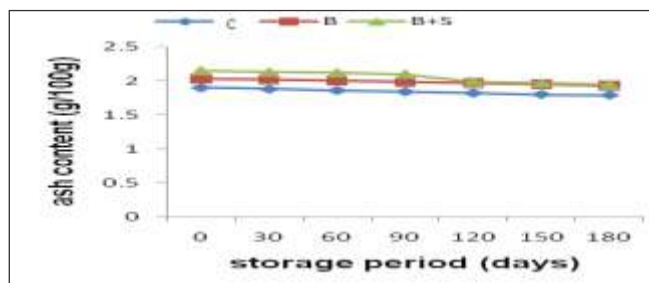


Fig 3: Effect of storage period on ash content (g/100g) of aonla powder at 70°C under hot air dryer

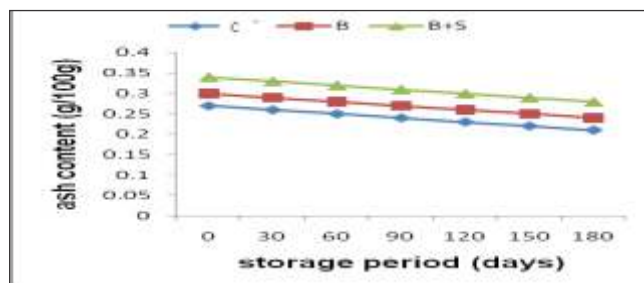


Fig 4: Effect of storage period on ash content (g/100g) of aonla powder at 70°C under osmo-air drying

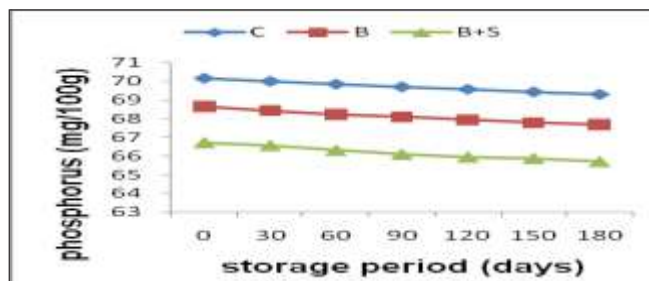


Fig 5: Effect of storage period on Phosphorus (mg/100g) of aonla powder at 60°C under hot air drying

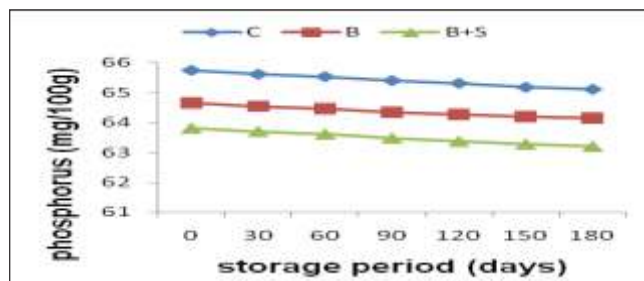


Fig 6: Effect of storage period on Phosphorus (mg/100g) of aonla powder at 60°C under osmo-air drying

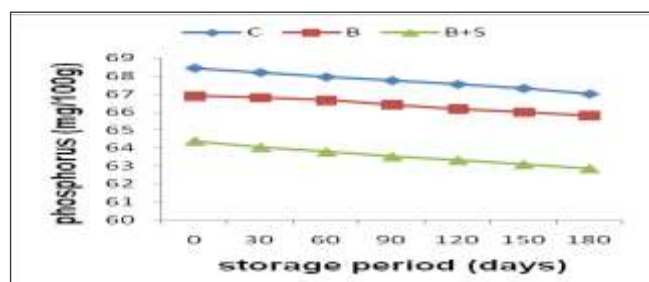


Fig 7: Effect of storage period on Phosphorus (mg/100g) of aonla powder at 70°C under hot air drying

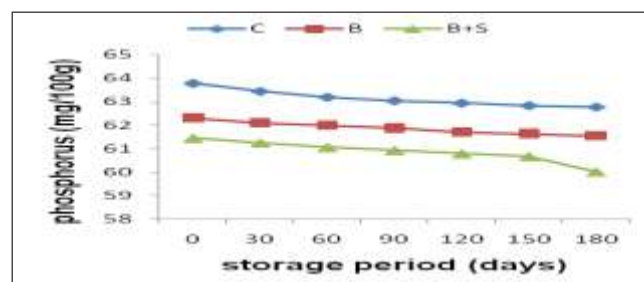


Fig 8: Effect of storage period on Phosphorus (mg/100g) of aonla powder at 70°C under osmo-air drying