

Research Paper :

Comparative study of Aonla drying by natural, solar and mechanical methods

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ABSTRACT

Aonla (*Phyllanthus emblica*, L. Or *Emblica officinalis*, G.) is important tropical and subtropical deciduous tree of commercial importance. Total area of this crop under cultivation throughout India is 49.62 thousand ha while total production of Aonla is 111.10 thousand metric tonnes. Aonla is valued for nutritional and medicinal properties. It is also useful in Ayurvedic and unani system of Indian medicines. The local variety of Aonla was selected for studies of drying characteristics. The drying of Aonla was undertaken in the form of slices and shreds. Three different treatments used were natural drying, solar drying and mechanical drying (at 50°C, at 55°C, at 60°C). The different drying curves were analyzed and value of drying constant for each treatment was calculated. Different engineering properties were analysed before and after drying. Bulk density was found to be 1368.93 kg/m³ and 324.86 Kg/m³, True density was 2747.46 Kg/m³ and 1444 Kg/m³ and porosity was found to be 50.72% and 78.72% before and after drying. Heat utilization factor for solar drying was 0.6568 and for mechanical drying it was 0.2808. The value of drying constant was found 1.0247 hr⁻¹ for mechanical drying of Aonla slices at 50°C and 0.9556 hr⁻¹ for solar drying of Aonla shreds. Organoleptic evaluation was undertaken to evaluate the effect of different drying methods and temperature combination for Aonla slices and shreds considering all aspects such as colour, texture and test.

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Aonla is botanically classified as *Phyllanthus emblica*, L. or *Emblica officinalis*, G. It is also known as Indian goose berry, helli, amalkamu or amla. It is one of the important tropical and subtropical deciduous tree of commercial importance. It belongs to family Euphorbiaceae (Tripathi *et al.*, 1988).

Aonla fruits get ready for harvesting in November to December. But fruits may be allowed to remain on tree until February without fruit drop. The optimum stage of harvesting falls between second week of December to third week of January (Ram *et al.*, 1983). Fully grown tree yields 2.5 to 3 quintals of fruits per year (Kalra, 1988).

Total area of this crop under cultivation throughout India is 49.62 thousand ha while total production of Aonla is 111.10 thousand metric tonnes. While in case of Maharashtra it occupies an area of 4.00 thousand ha and contributing production of 5.6 thousand metric tonnes with the productivity of 1.4 t/ha. (Market Survey of Aonla, UPLDC – Nov. 2002).

Aonla fruit is a rich source of ascorbic acid and contains about 20 times more vitamin C than citrus fruit (Chadha, 1992). The fruit contains 450–682 mg/100 gm ascorbic acid, moisture 81.2 per cent, reducing sugars 5.57 per cent, starch 3.00 to 7.23 per cent and small amount of calcium, phosphorus, iron, nicotinic acid, thiamine and tannin (Shrivastava and Shrivastava, 1964; Teotia *et al.*,

1968; Gopalan, 1971; Ram *et al.*, 1983; Deb and Chandrasekhar, 1960).

Aonla is valued for nutritional and medicinal properties. The fruit contains considerable amounts of polyphenols that retard the oxidation of ascorbic acid. Aonla is valued as an antiscorbulic, diuretic laxative, alternative antibiotic and is used in treating chronic dysentery, bronchitis, dysperisa and cough. It is useful in Ayurvedic and Unani system of Indian medicines. (Khan and Moheet, 1958; Tripathi *et al.*, 1979)

The traditional methods of Aonla drying are cumbersome, unhygienic and laborious. These methods result into the contamination of products due to dust, ash, insects and birds. The open sun drying requires large drying time as well as it is an uncontrolled drying method and hence reduces cost of final products. In this context, present research study was carried out to reduce the processing losses during drying and to retain quality of dried products.

METHODOLOGY

Drying of aonla:

Freshly harvested Aonla fruits of local variety were taken for drying. They were firstly cleaned and then cut into slices and shreds of uniform size by means of knives and grater.