

Effect of moisture content on biophysical properties of pomegranate seeds

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Aim. The aim of the present study was to determine the moisture dependent physical properties of dried pomegranate seeds as a function of moisture content. **Methods.** In this study the moisture dependent physical properties of dried pomegranate seeds in the moisture range of 12-24% (w.b.) were determined. **Results.** The major diameter (length), intermediate diameter (width), minor diameter (height) and unit mass of pomegranate seeds increased from 6.90 to 7.13 mm, 3.02 to 3.20 mm, 2.44 to 2.64 mm and 0.029 to 0.039 g as the moisture content increased from 12% to 24%, respectively. The bulk density, true density and angle of repose increased, whereas the porosity decreased with the increase in moisture content. The angle of repose, bulk density and true density increased from 24.79^o to 29.659^o, 469.33 to 521.33 kg.m⁻³ and 0.825 to 0.875 kg.m⁻³ respectively for the same moisture increase.

Conclusion. Although, the static coefficient of friction of pomegranate seeds on different surfaces increased by increase in moisture content; this increase was not similar in all surfaces.

Key words: Punicaceae - Fruit - Seeds.

The pomegranate (*Punica granatum* L.) fruit, native of Iran, is extensively cultivated in Spain, Egypt, Russia, France, Argentina, China, Japan, the USA and in India ¹ and is one of the oldest edible fruits. The total pomegranate production in Iran was 665,000 tons in 2003.² The versatile adaptability, table and therapeutic values and better keeping quality are the features responsible for its cultivation on

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a wide scale.³ They are also used in the preparation of fresh juice, canned beverages, jelly, jam and paste and for flavoring and coloring drinks, etc.^{4, 5} Pomegranate is commercially grown for its sweet-acidic taste of the arils ⁶ which are ranging between 40 and 100 g.kg⁻¹ of fruit weight depending on cultivar.

The seeds of diverse varieties of pomegranate are rich sources of essential oils (essentials fatty acids). Data on fatty acid composition in the seed oil of pomegranate also help to establish the chemotaxonomic relationships among the studied varieties.

In addition to being rich in vitamin C and minerals, pomegranate arils find wide application in traditional Asian medicine for stomachache, diarrhea, bronchitis, etc. ⁷ the knowledge of important physical properties such as shape, size, volume, density, porosity, angle of repose is necessary for the design of the various separating, handling and storing systems. For example, the size and shape are important in their separation from undesirable materials and development of sizing machinery. Bulk density, true density and porosity can be useful in sizing and storing facilities.

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