

Cryogenic Grinding of Mango (*Mangifera indica* L.) Peel and Its Effect on Chemical and Morphological Characteristics

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Abstract : The fruit and vegetable industries are responsible for producing huge amount of waste, which is a problem to environmental safety and should be utilized efficiently. Mango (*Mangifera indica* L.) is an important commercially grown fruit and referred as the "King of fruits". In 2015, India was the largest producer (18.506 MT) of mangoes and out of which 9.16 % lost during post-harvest handling. The mango kernel and peel represent approximately 17-22% and 7-22% of the overall mass of fruit respectively and discarded as waste. Hence, an attempt has been made with three mango cultivars (Langra, Dashehari, Fazli) to investigate the effect of cryogenic grinding on various characteristics of mango peel powder (MPP). The cryogenic grinding is an emerging technology which is used for retention of beneficial volatile and bioactive components. The feed rate was highest for Langra followed by Chausa. The samples have 2-4% fat along with significant amount of protein (4-6%) and crude fiber (9-13%). Mango peel is also a good source of minerals such as calcium, potassium, manganese, iron, copper, zinc, and magnesium. Interestingly, the significant amount of essential minerals like phosphorus and chlorine in all the varieties was found with the highest value in Langra (phosphorus 10.83% and chlorine 2.41%) which are not reported earlier. SEM analysis revealed the surface morphology and shape of the particles. Waste utilization is a promising measure from both an environmental and economic point of view. Chemical characterization of the samples indicated its potential to be used for the fortification of food products which in turn reduces hazards due to waste and improve functional quality of the foods.

Keywords : cryogenic grinding, morphological, mineral composition, SEM

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