Comparison of Conventional and Advanced Drying method on the Sweet lime (Citrus limetta) peel waste: Nutritional, Functional & Color Profile
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Introduction
- Sweet lime (Citrus limetta) also known as “Mosambi” is one of the popular citrus fruit. Owing to its unique appealing taste, flavor, and aroma, sweet lime is a highly valued fruit.
- It is often consumed fresh or processed in the form of juice. Processing lead to generation of large amount of waste in the form peels (50-55%), seeds and pomace.

Solar Drying Process
- Conventional solar dryer having evacuated tube collector was used for drying of peels.
- The average temperature of the solar dryer in the peak hours (12:00 p.m -2:00 p.m.) was 51°F (±2°C) with relative humidity (30-40%).
- Drying operations were conducted till a constant weight of peels was obtained.

Infra-Red Drying Process
- An infrared dryer developed at NIFTEM, India was used for conducting the experiments.
- The drying process was conducted at temperature (60°C) and constant air velocity (2.1 m/s).

Results

Drying Behavior
- The initial moisture content of fresh peels was observed to be 85.20% (db).
- In comparison to the conventional solar dryer, the advanced infrared dryer took the lesser time (4 hours) for drying.

Proximate Composition
- Infrared drying method was the best way to preserve the nutrients such as ash content, protein, and fiber content.

<table>
<thead>
<tr>
<th>Parameters (g%)</th>
<th>Infrared Drying</th>
<th>Solar Drying</th>
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</thead>
<tbody>
<tr>
<td>Crude Fibre</td>
<td>15.67±0.84</td>
<td>14.47±0.55</td>
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<tr>
<td>Crude Fat</td>
<td>1.23±0.04</td>
<td>1.29±0.02</td>
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<tr>
<td>Crude Protein</td>
<td>8.02±0.30</td>
<td>7.87±0.61</td>
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<tr>
<td>Crude Ash</td>
<td>5.92±0.03</td>
<td>4.88±0.63</td>
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Bioactive Composition

Infrared drying method showed high L* lightness and b* yellowness values.

Color Parameters

Methods

Drying Process
- Sweet lime peels were dried in two different drying units. 200g of peel sample was taken for the single-layer drying process.
- Initial moisture content of fresh peels was calculated using standard hot air oven dry method.

Aim
- To study the drying behavior of sweet lime (Citrus limetta) peel waste to improve its applicability.
- To check the effect of drying methods (solar drying and infrared drying) on the nutritional, functional, and color profile of the sweet lime peels.

Conclusions
- Sweet Lime peel waste contain good repository of nutrients and bioactive compounds.
- It could be implied from the study that advanced infrared drying is a suitable method in terms of preserving the quality attributes of the sweet lime peels.
- Infrared dried peel powder could be a good resource of significant valuable components, in this way encouraging the zero-waste theory.

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