

Process Development for Antioxidant Extraction from Wet Pomegranate Peel

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Background

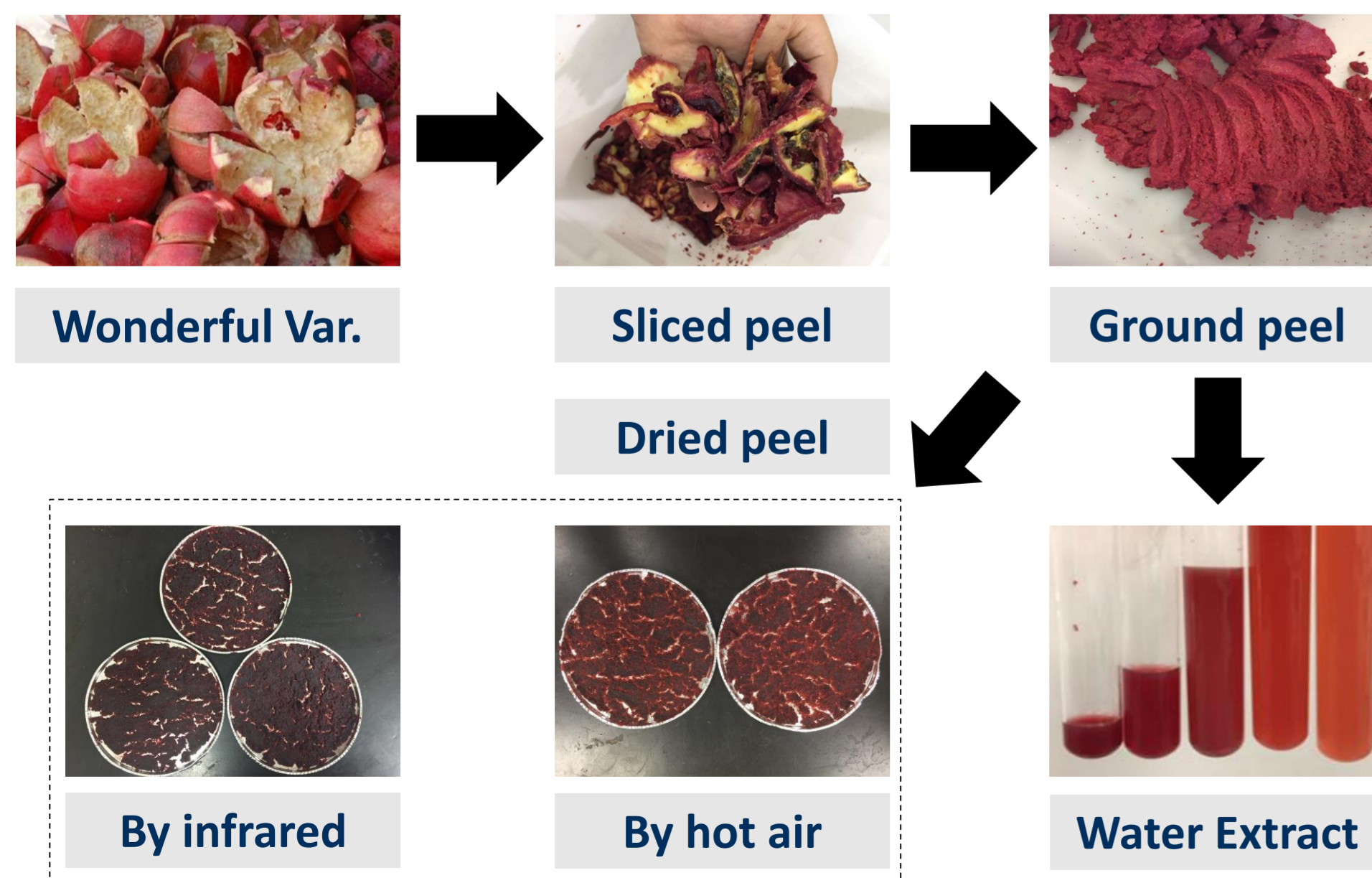
- Pomegranate cultivation in California is increasing every year.
- About 283,000 tons of pomegranate was produced in US valued at 115 million dollars.
- The by-products of Pomegranate juice industry (peel and seed) are used as animal feeds or discarded.
- Pomegranate peel is rich in antioxidants beneficial for anti-inflammation, anti-aging and anti-cancer.

Objectives

The objective of this study was to develop a process for extraction of water-soluble antioxidants from wet pomegranate peel.

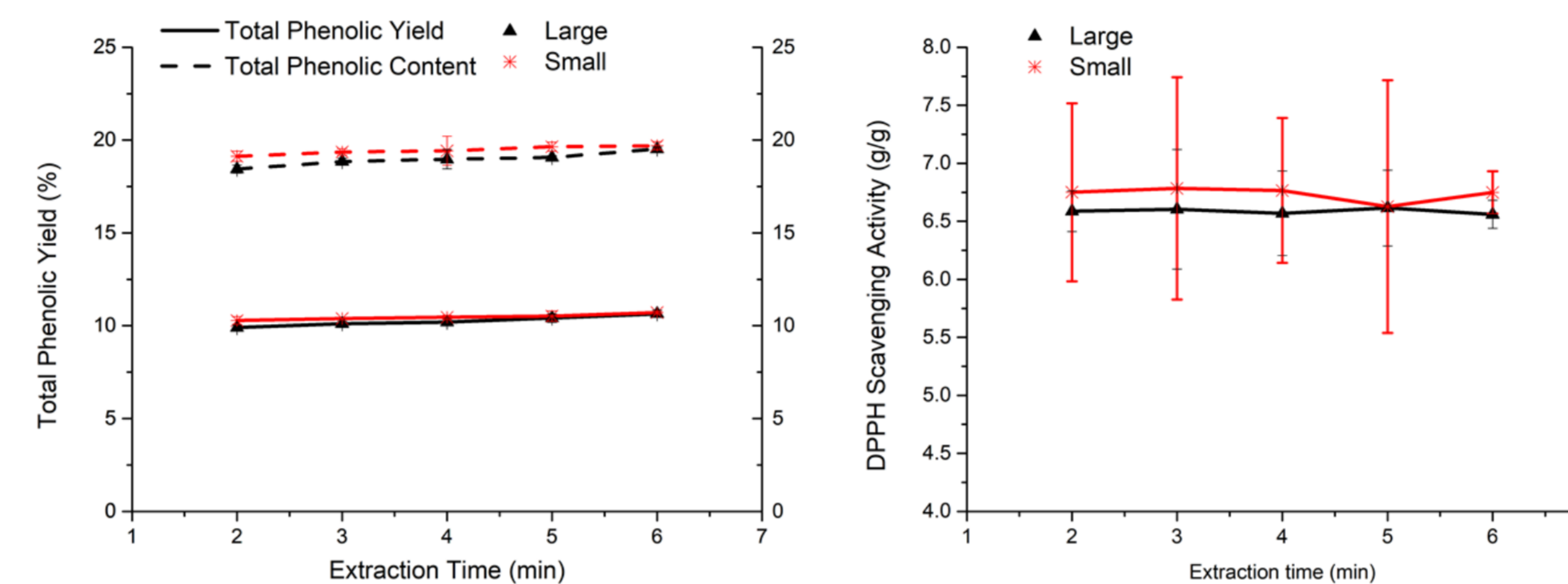
Methodology

Production of pomegranate fine peel particles using slicing and grinding. Comparison with the peels dried by hot air and infrared radiation.

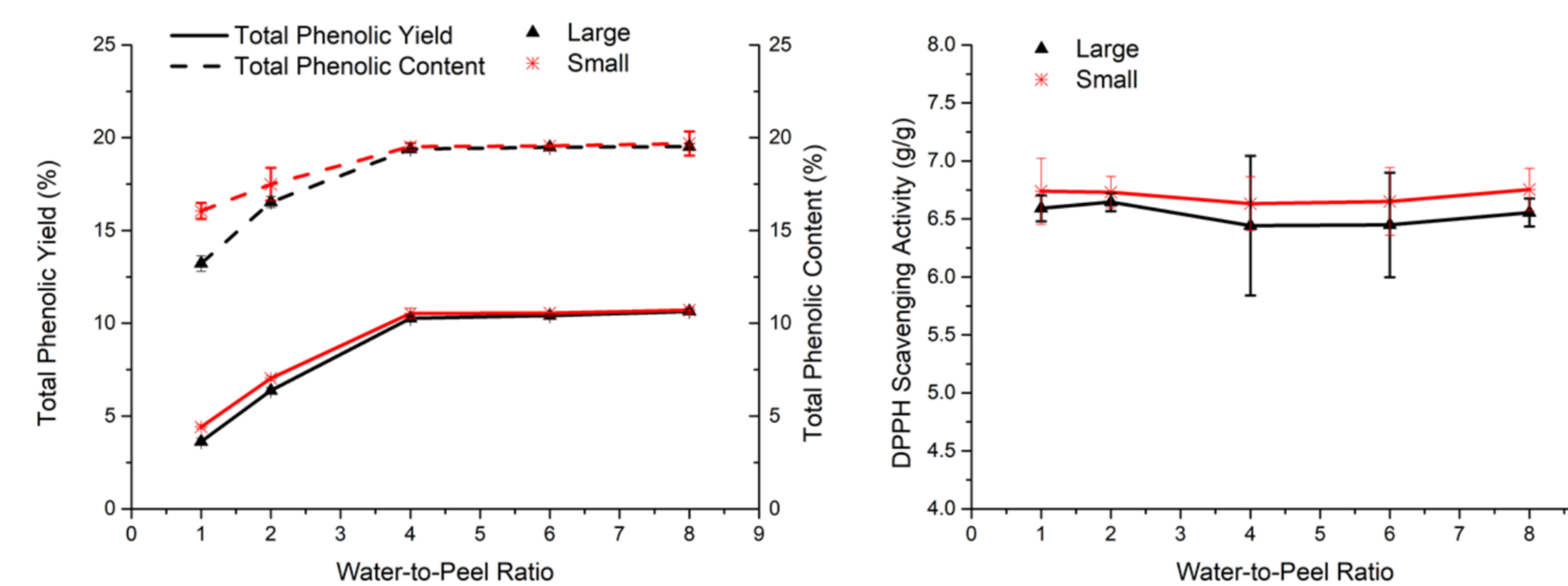


Results

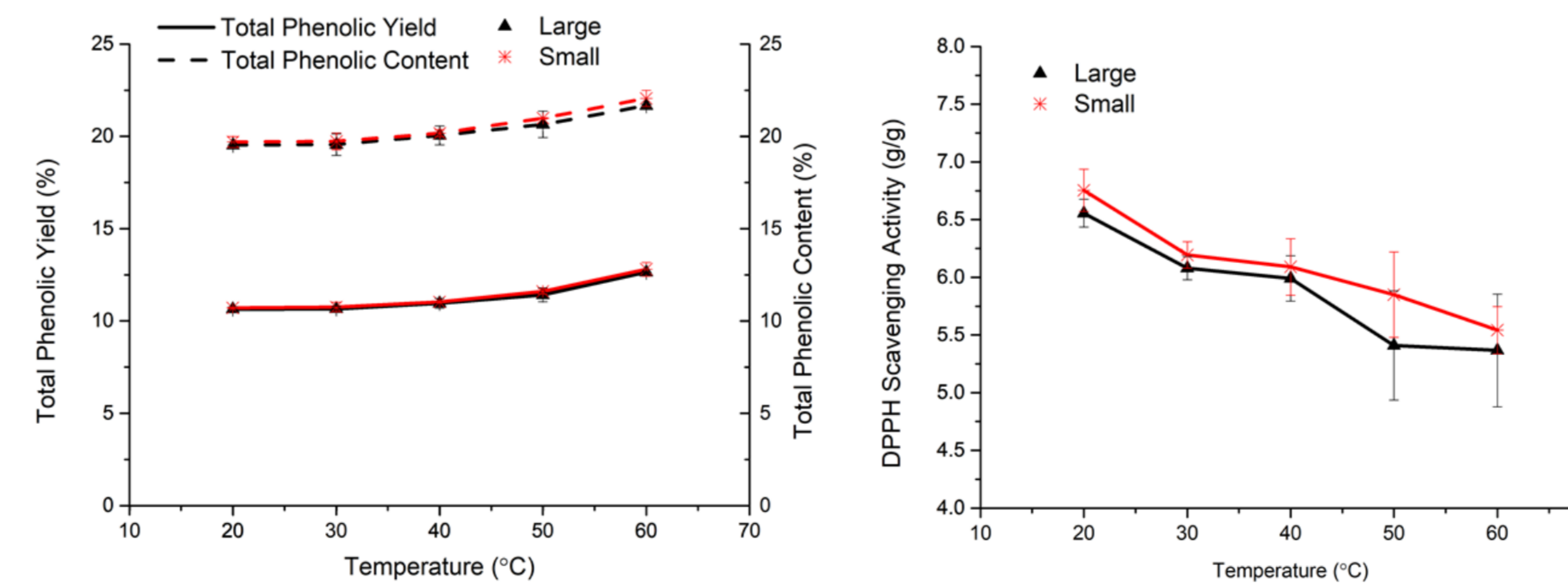
Extraction Time Effect (2/3/4/5/6 mins; 8* water; 20 °C)



Water-to-Peel Ratio Effect (6 mins; 1/2/4/6/8* water; 20 °C)



Temperature Effect (6 mins; 8* water; 20/30/40/50/60 °C)



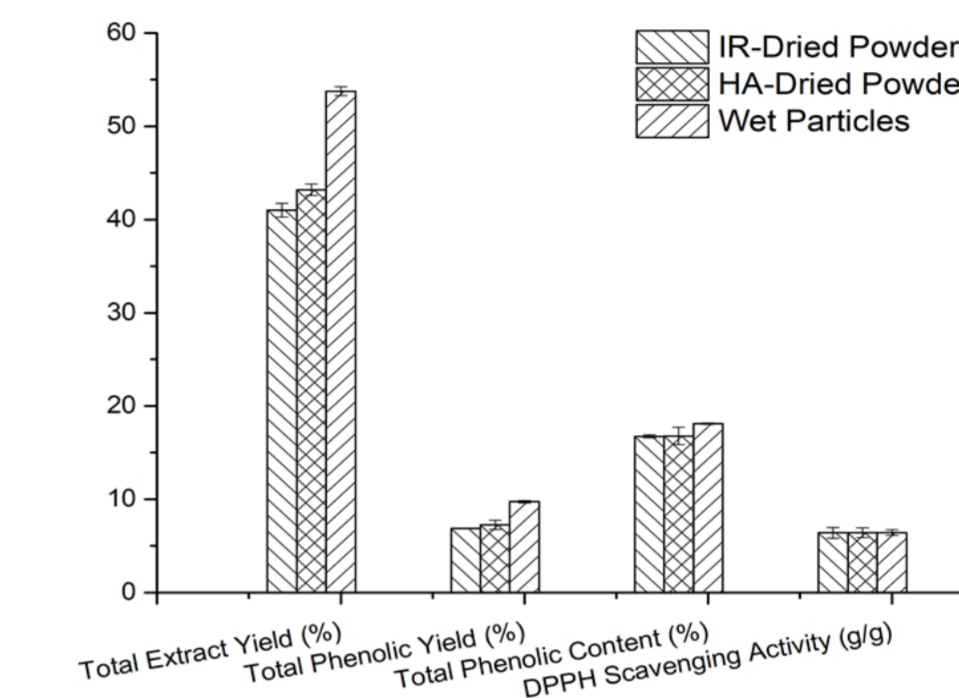
Phenolic Yield and Content

DPPH Scavenging Activity

- Phenolic Yield: g phenolic/ g dried peel
- Phenolic Content: g phenolic/ g dried extract
- DPPH Scavenging Activity: g DPPH/ g phenolic

Results (Cond.)

Comparison with Hot Air/ Infrared Dried Peel



Wet peel extraction

- 10% > extract yield
- 2.5% > phenolic yield
- Similar DPPH scavenging activity

Expected Yield Calculation

Optimal condition (6 mins; 20 °C; 4* water)

1 ton wet peel → 155.73 kgs dried peel →

82.72 kgs dried extract →

16.04 kgs dried phenolics

Discussion

The new process could be used for extraction of phenolic compounds from wet peels with

- High antioxidant activity suitable for the preparation of fortified food products.
- Reduced pre-processing time and energy for drying, increasing the process efficiency.
- Eliminated organic solvent usage, but moderate water usage for food safety concern.

Acknowledgement



CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

Project number: SCB16014
Project manager: Sheila Morco



Pomegranate Council



SunnyGem