



Florida Olive Council, LAA

Extraction Research at USDA Ft. Pierce

3/22/2018

Below is described research on better utilization of the citrus crop. The research suggests profitability for extracted essential oils, pectic hydrocolloids in particular, if the cost of extraction can be better managed.

The Florida Olive Council and Lykes Brothers Corporation are working with USDA scientist Dr. Christina Dorado to evaluate the extraction of essential oils from olive leaves. Later this year (2018) olive leaves will be harvested from Lykes Brothers grove near Lake Wales and sent to Dr. Dorado's lab for extraction experiments. The results of these experiments may provide more information about olive leaf extract's profitability.

[Enhancing Utilization of Citrus Processing Co-products](#)

Technical Abstract: Pectic hydrocolloids from citrus peel waste are highly functional molecules whose utility and application have expanded well beyond their traditional use in jams and jellies. They are now finding applications in health, pharmaceutical and personal care products as well as functioning as emulsifiers, encapsulants, biobased film components, stabilizers, ion capture agents and generalized rheology modifiers of aqueous systems. Their adoption for industrial applications has been hindered by their high cost of extraction, harsh extraction chemistry and other market forces that prevent their use for high volume/low cost industrial processes. Their functionality is associated with their polyanionic nature, the ability to engineer the total amount and intramolecular distribution of anionic charge within a population of molecules and their molecular weight. Over 85% of the world's marketed pectic hydrocolloids are isolated from citrus fruit peel, generally from Central and South America. For the most recent harvest seasons in Brazil and the USA, there were approximately 3.2×10^5 metric tons of pectic hydrocolloids available for recovery. Even though the compound annual growth rate for pectin demand is predicted to increase by 8% from 2016 – 2021 the vast majority of citrus fruit peels, along with the pectin they contain, are converted to low cost animal feed. Traditional extraction methods utilize harsh acidic extractions and alcohol precipitations. Previously we demonstrated an environmentally friendly continuous, pilot-scale steam explosion process to release pectic hydrocolloids, and other valuable chemicals, from their intracellular entrapment and their recovery by a simple water wash. However the pectic hydrocolloid functionality was limited due to fragmentation during the steam explosion process. In an effort to optimize processing conditions to decrease fragmentation and maintain molecular weight we have explored the variables of temperature and time-at-temperature on the molecular weight and rheological properties of the recovered pectic hydrocolloids.