

## **Licensing and Technology Transfer Opportunity: Manipal University**

### **Title of Technology Available:**

#### **Extraction of Pectin from Orange Peels Using Sonication**

### **Brief Description of Invention:**

We have discovered that pectin can be extracted from Orange peels using sonication. Ultrasound assisted extraction is a less expensive process that uses acoustic energy and solvents to extract pectin from orange peels in relatively shorter times than with conventional extraction techniques with a higher yield.

### **Brief Background of Invention:**

There are two broad methods of pectin extraction from orange peels. The conventional methods includes direct boiling which takes approximately 2-3 hours to obtain a good yield of pectin. The pectin was found to be well extracted in an acidic aqueous medium and the widely used extraction solvents for pectin extraction are water with mineral acids like nitric, hydrochloric or sulphuric acid, phosphoric acid, citric acid .

Flash extraction method involves mixing, heating and maintenance of pectin containing sample in an acidic medium under pressure to a target temperature by steam injection and allowed to flash in a tank to extract pectin from orange peel.

Microwave-assisted extraction is an extraction technique that make use of microwave energy to heat the solvent and the sample.

### **Describe the final product:**

Pectin

### **Technological Domain (Keywords):**

Pectin, Ultrasound, Orange peel, Sonication

### **Proof of Concept:**

The ultra sound energy of 750 Hz, 40% amplitude with pulse of 5/3 minutes was applied for 20 minutes which gave maximum yield of pectin(10-15%) per gram of orange peel powder.

**Stage of Development:** Ideation/Prototype/Advanced Prototype/Market Ready product:

### **Provide Information on Competitors who manufacture and/or sell similar products:**

Pectin is widely used as a functional ingredient in the food industry due to its ability to form aqueous gels and has been used in jams and jellies, fruit preparations, fruit drink concentrates, fruit juice, desserts and fermented dairy products. It has also wide application in the pharmaceutical industries and medical field.

### **What are the unique advantages your innovation has compared to the competition:**

Ultrasound assisted extraction is a less expensive process that uses acoustic energy and solvents to extract pectin from orange peels in relatively shorter times than with conventional extraction techniques with a higher yield

**Have you approached any company/industry to manufacture/license/and sell your invention?:**

**If yes, Provide details of the company/organization and the contact person.**

No

**Any other information that might be useful:**

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**Intellectual Property Status:**

Submitted to TTE, MU