ABSTRACT

Name: Sumi Barman
Degree: M.Tech in Food Processing Technology
Semester and year of admission: 6th , 2009 – 12
Roll No: FPT09004
Department: Food Engineering and Technology

Thesis Title: Effects of Pectinase from *Aspergillus niger* Using *Musa bulbisiana* Peel on Extraction and Clarification of Fruit Juices.

Supervisor : Mr. Nandan Sit

Pectinases are important industrial enzymes which catalyze the degradation of pectic substances that occur in higher plants and are constituted by a main chain of polygalacturonic acid branched with other sugars. These enzymes are used to facilitate extraction, filtration and clarification and to increases yields in the production of fruit juices and beverages. The increasing energy demands have focused worldwide attention on the utilization of renewable resources, particularly agricultural and forest residues, the major components of which are cellulose, starch, lignin, xylan and pectin. The aim of this work was to optimize cultivation conditions for pectinase production using *Musa bulbisiana* (Bhim kol) peel as substrate and the partial purification of a crude filtrate by ammonium sulfate precipitation and ethanol precipitation and characterize the enzymes for its potentiality towards industrial applications in clarifying fruit juices and increases yields in the production of fruit juices. The study reveals that among both the techniques the highest activity of partially purified enzyme was found in ethanol treated enzyme as compared to salt purified and crude enzyme i.e. 0.0722 U/ml, 0.0704 U/ml and 0.0670 U/ml respectively. The enzyme had time, temperature and substrate concentration optima of 62.30 hrs, 32.5°C and 8.99% respectively. Clarification of banana and watermelon juice using the partially purified enzyme resulted in absorbance value of 0.367 in 30 min which latter reduces to 0.325 in 40 min with increase in concentration of enzyme the value further decreased to 0.11 in 30 min and 0.108 in 60 min and 0.399 to 0.228 from 30 min to 60 min and with increase in concentration of enzyme it further decreased from 0.019 to 0.017 in 30min to 60 min when treated with ethanol purified enzyme respectively which shows increase in clarification as determined spectroscopically and increase in yield in extraction of juice was resulted approximately same by both the partially purified enzyme in about 25% than the untreated fruit pulp. To achieve this various research and studies is being conducted. *Aspergillus niger* MTCC 281 species was being used in this work for the production of Pectinase enzyme.

Key words: *A. niger*; Pectinase; Banana juice; Watermelon juice; Clarification; Extraction