To The Supreme Soul
PREFACE

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. These materials have attracted considerable attention as an alternative feedstock and energy source, since they are abundantly available. Several microbes are capable of using these substances as carbon and energy sources by producing a vast array of enzymes in different environmental niches.

The commercial application of pectinases was firstly observed in 1930’s for wine and fruit juice preparation. Only in the 1960’s, when the chemical nature of plant tissues becomes apparent, the scientists began to use a greater range of enzymes more efficiently. As a result, pectinases are today one of the upcoming enzymes of the commercial sector. Primarily, these enzymes are responsible for the degradation of the long and complex molecules called pectin that occur as structural polysaccharides in the middle lamella and the primary cell walls of young plant. Pectinases are now an integral part of fruit juice and textile industries as well as having several biotechnological applications.
Pectic substances are widely distributed in (10-30%) fruits and vegetables, in turnips, peels of orange, in pulps of tomato, pineapple and lemon, hence they form important natural substrates for pectinases. Pectic substances are complex high molecular mass glycosidic macromolecules found in higher plants. They are present in the primary cell wall and are the major components of the middle lamellae, a thin extracellular adhesive layer formed between the walls of adjacent young cells. In short, they are largely responsible for the structural integrity and cohesion of plant tissues.

Enzymes which degrade pectic substances are pectinases or pecteolytic enzymes and can be classified into three types. Pectin methyl esterase (PME) hydrolyzes the methyl ester of galacturonide chain liberating methanol. Polygalacturonases (PGases) and pectate lyases (PLases) split the molecular chains of the respective polymers. Since 1940s, pectinases have been exploited for many industrial applications. Pectinases are mainly used for increasing filtration efficiency and clarification of fruit juices, in wood preservation and used in maceration, liquefaction and extraction of vegetable tissues. Various literature reports and reviews are available on the production and applications of pectinases.
Pectinases constitute a unique group of enzymes which catalyze the degradation of pectic polymers present in the plant cell walls. Pectinases are produced by many organisms such as bacteria, fungi and yeasts. In the industrial sector, acidic pectinases are used in the extraction and clarification of fruit juices, whereas alkalophilic pectinases are immense use in the degumming of ramie fibers, retting of flax, plant protoplast formation and treatment of effluents discharged from fruit processing units. Although the major sources of pectinases are bacteria and fungi and esp. pectinases are produced from alkalophilic bacteria, mainly *Bacillus sps.*