CHAPTER I

INTRODUCTION

Enzymes are the catalysts of biological processes. Actually the living live need the biochemical reaction for living no matter what plants, animals or microorganism. In 1970, plants and animals are the enzyme resources; nowadays microorganism is the major role for enzyme resources in the part of its technical and economical advantages. When compare enzyme production in plants, animals and microorganism, the microorganism is the most important enzyme resources due to animals and plant's growth rate is very slow, depends on the area to plant or feeding. By contrast, microorganism that can use the various raw material to be culture media and present high productivity by using short time. Beside this we can increase microorganism's ability for enzyme's production by improving environment or strain, induced mutation by using inducer in culture media. In addition, whatever enzyme's production from plants or animals, microorganisms do. Only choose the suitable strain to use [1,2].

Amylases are used for hydrolyzing flour in industry instead of acid for maltodextrin producing because acid hydrolysis must be reacted at the high temperature. This process's ability depends on concentration of acid, time and temperature. Unwanted products would be produced from this method such as ferfural, etc. So the enzyme came to be the better choice because the virulent environment did not need when use enzyme to produce, enzyme products are specific for each industry, can control reaction easily and no unwanted terminal product [3].

Amylase can be use in the various industries which require enzyme's qualifications are heat tolerance, stability, high reactivity and high productivity. A number of microbial source exist for the efficient production of this enzyme, but only a few selected strains of fungi and bacteria meet the criteria for commercial production. In order to achieve the efficient, large-scale production, the structural and functional relationship of amylase has to be known in detail. This will lead to an improving the stability of the existing enzymes and the discovery of the new ones [4].

Many fungi have the ability to synthesize a variety of extracellular enzyme and most of these have been mainly isolate from soil. However, many fungi still remain uninvestigated. Particularly of interest is the environment of the aerial parts of plants with which the fungi are associated [5].

Endophytic fungi have complex association with their plant host. They live in the intercellular and intracellular of plant tissues. Endophytic fungi produce beneficial secondary metabolites for the plant host including insect repellent, enzyme inhibitor for weed's growth. Some bioactive compounds can be used to be medicine such as anti-cancer, diabetic medicine etc. Endophytic fungi produce the various kinds of protein. Most of them can decompose the organic compounds [6].

Objective

The objective of this work is to isolate endophytic fungi capable to producing amylase and describe the purification and partial characterization of an amylase from endophytic fungi.

Scope of work

In initial work, screening endophytic fungi can be produce starch hydrolyzing enzyme. Enzyme was precipitated by ammonium sulfate and separated by Ion Exchange Chromatography and Gel Filtration, respectively. Amylase fractions were characterized by SDS-PAGE to determine molecular weight and purity of amylase. Moreover, study optimum temperature, pH, the effects of metal ion, substrate specificity and kinetic properties of amylase. After that, amylase from purification will be identified by Mass Spectrometry.