Research Article

Isolation and identification of enzyme from seaweed

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ABSTRACT

Introduction: Protease is one of the important industrial enzymes which was produced from various sources. **Materials and Methods:** In this study, protease was isolated from marine algae such as *Gracilaria corticata, Cladophora vagabunda, Chaetomorpha antennina,* and *Ulva* spp. Protein concentration and special activities were measured and compared for these species. **Results:** Among these, *G. corticata, C. Vagabunda, and C. antennina* showed maximum specific activity (7.53, 6.77, and 6.75 units/mg of protein) of protease, respectively. **Conclusion:** This work reveals that the seaweeds are the vital source for enzyme.

KEY WORDS: Enzyme, Protein, Seaweeds, Specific activity

INTRODUCTION

Marine algae are generally classified as red algae, brown algae and green algae. These are used for the production of important enzymes. These seaweeds have wide range of uses such extraction of biodiesel, treating of industrial effluents etc.[1-4] Alpha amylase were extracted from marine brown algae *Stoechospermum marginatum*.[5] A fibrinolytic enzyme was isolated from a marine green algae *Codium latum*, and designated Chodiumlactum protease (CLP). It also had fibrinogenolytic activity.[6] In this study, marine macro algae were used to isolate protease enzyme and its specific activity were studied.

Enzymes are commercially used many industries such as food, pharmaceutical, detergents, diagnostic recovery of silver, and fine chemical industries.[7] Many studies revealed that extracellular alkaline proteases can be produced by fungi.[8] Alkaline proteases produced from *Scolebasidium* spp. and *Dendryphiella* spp. are used in detergent industries.[9]

Candida lipolytica and *Aureobasidium pullulans* produce alkaline proteases.[10,11] Only few studies exist on the alkaline protease producing alkalophilic actinomycetes.[12]

Few of the *Streptomyces* and *Pseudomonas* spp. are also producing proteases. By contrast, similar information on marine algae is lacking and few investigations of the enzyme systems of marine algae have been reported although the chemical structure of many of the end products of anabolism has been investigated.[13]

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MATERIALS AND METHODS

Sample Collection

Seaweeds were collected from Pulicat and Covelong, Chennai, Tamil Nadu. Then they were identified at Dr.Krishnamoorthy algalogy laboratory (Chennai, Tamil Nadu, India) as G*racilaria corticata, Chladophora vagabunda, Chaetomorpha attenina Ulva s*p. After identification, these samples were thoroughly washed and were dried under sun light then the dried samples were crushed into small particles by using mixer. Then the powdered samples were stored in a container.

Extraction and Partial Purification of Protease

Protease was extracted from seaweeds and was partially purified by 70% ammonium sulfate precipitation and fed Sephadex column as per standard protocol.

Estimation of Specific Activity

The specific activity of protease was measured spectrophotometrically.

RESULTS AND DISCUSSION

Table 1 shows the specific activity of seaweed collected from Covelong and Pulicat. Among these, *G. corticata*

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Table 1: Specific activity of protease

Sample	Place	Sp. Activity (units/mg of protein)
Gracilaria corticata	Covelong	7.53
Cladophora vagabunda	Pulicat	6.77
Chaetomorpha antennina	Pulicat	6.75
Ulva spp.	Covelong	5.88

from Covelong showed higher specific activity (7.53 units/mg of protein), followed by *C. vagabunda* from Pulicat Lake 6.77units/mg of protein and *C. antennina* from Pulicat Lake 6.75 units/mg of protein. The least specific activity was found in *Ulva spp.* collected from Covelong (5.88 units/mg of protein).

CONCLUSION

In this study, it is clear that macroalgae are used as the best source of the extraction of protease enzyme. Other than these, macroalgae can also be investigated for the extraction of other enzyme and its characterization. Very limited work has been done on enzyme production using macroalgae which calls for more detailed research in future.

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