ABSTRACT

Bromelain is a sulfhydryl proteolytic enzyme obtained from pineapple, Ananas comosus. The aims of this special problem are to study bromelain activity in various parts of pineapple such as peel, core, and fruit to investigate the optimal conditions for bromelain activity. After extraction of crude bromelain, the proteolytic activity was measured by spectrophotometry using casein solution as a substrate. It was found that, the maximum activity of crude bromelain was detected in stem as 2.50 ± 0.05 Casein Digestion Units; CDU/mL. The optimum temperature for the reaction of bromelain in all part of pineapple was detected as the same; 37, giving the activity 1.70, 2.50 and 1.91 CDU/mL from peel-, core-, and fruit bromelain, respectively. The suitable reaction times were also studied. The result showed that, the suitable reaction time of peel- and core bromelains were reach to maximum at 5 minutes, while the highest activity of fruit bromelain was detected at 30 minutes, giving the activity as 3.02, 0.92 and 1.81 CDU/mL, respectively.

INTRODUCTION

Bromelain is the sulfhydryl proteolytic enzyme that found in pineapple. It is accumulated in stem, fruit, peel, and core of pineapple. The active site of bromelain contains a Cystein-Histidine-Asparagine triad at the active site and mechanism involve a cysteine sulfhydryl group in catalytic site. Nowadays, bromelain has been used widely in many industry such as food industry, medical and pharmaceutical industry, leather industry.

Benefits of Bromelain
- Reduce the inflammatory process.
- Reduce the risk of cardiovascular disease.
- strengthen the immune system.

RESULTS

![Graph showing Enzymatic activity (CDU/mL) vs Temperature](image)

- The optimal temperature for all of crude bromelain activity is 37°C.

![Graph showing Enzymatic activity (CDU/mL) vs Reaction time (minutes)](image)

- The suitable reaction time of stem bromelain and peel bromelain activity were 5 minutes.
- The suitable reaction time of fruit bromelain activity was 30 minutes.

METHODS

**Crude bromelain preparation**

<table>
<thead>
<tr>
<th>Pineapple</th>
<th>Separated and Cut</th>
<th>Blended and Centrifuged</th>
<th>Measured pH and Volume</th>
<th>Stored at 0 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions: 10000 rpm, 15 mins, 4 °C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Determination of optimal conditions for bromelain activity**

- Effect of Temperature (10, RT, 37, 45 °C)  
  *RT = Room Temperature = 32 °C*
- Effect of Reaction time (0, 5, 10, 15, 30, 60 mins)

**CONCLUSIONS**

<table>
<thead>
<tr>
<th></th>
<th>Optimal temperature</th>
<th>Optimal reaction time</th>
<th>Enzymatic Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Bromelain</td>
<td>37 °C</td>
<td>5 minutes</td>
<td>0.92 CDU/mL</td>
</tr>
<tr>
<td>Fruit Bromelain</td>
<td>37 °C</td>
<td>30 minutes</td>
<td>1.81 CDU/mL</td>
</tr>
<tr>
<td>Peel Bromelain</td>
<td>37 °C</td>
<td>5 minutes</td>
<td>3.02 CDU/mL</td>
</tr>
</tbody>
</table>

REFERENCES


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