PROCEEDINGS PAPERS OF

1st INTERNATIONAL CONFERENCE ON CHEMISTRY, PHARMACY AND MEDICAL SCIENCES (ICCPM)
Theme: Advanced Research Development Base on Local Resources

Bengkulu, 27 – 28 November 2018

Editor: Deni Agus Triawan, S.Si., M.Sc

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FOREWORD

Assalamu’alaikum warahmatullahi wabarakaatuh and greetings.

This proceeding contains selected papers of 1st International Conference on Chemistry, Pharmacy, and Medical Sciences (ICCPM) which held on November 26-27, 2018, Santika Hotel, Bengkulu-Indonesia. The conference which was organized by the Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Bengkulu.

The ICCPM 2018 is attended by more than 100 participants. In terms of origin, the participants of this ICCPM are coming from 6 countries i.e. Indonesia, Japan, US, Malaysia, Thailand, and India. The conference is the first international conference organized by the Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Bengkulu and is expected to be held continuously every three years.

The conference particularly encouraged the interaction of research students and developing academics with the more established academic community in an informal setting to present and to discuss new and current work. Their contributions helped to make the conference as outstanding. The papers contributed the most recent scientific knowledge known in the field of Organic Chemistry, Material Chemistry, Pharmacy, Agricultural Chemistry, and Miscellaneous topic related to chemistry.

Our deep gratitude is strongly forwarded to all individuals who took part in the conference, especially the keynote speakers, invited speakers, all the presenters and participants as well as all students and staffs who have been involved in the preparation and execution of the conference and the publication of the proceedings. Our deep gratitude also forwarded for all reviewers the manuscript for this proceedings.

These Proceedings will furnish the scientists with a good reference book. I trust also that this will be an impetus to stimulate further study and research in all these areas.

Bengkulu, 30 November 2018
General Chair of ICCPM
Prof. Dr. Morina Adfa, M.Si

Bengkulu, 30 November 2018
General Chair of ICCPM
Prof. Dr. Morina Adfa, M.Si
Committee

1st International Conference on Chemistry, Pharmacy and Medical Sciences (ICCPM, Theme: Advanced Research Development Base on Local Resources)

Santika Hotel, 27-28 November 2018

Organized by Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Bengkulu

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- Dwi Dominica, S.Farm., M.Farm, Apt
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1. Prof. Dr. Mamoru Koketsu (Gifu University, JAPAN)
2. Prof. Dr. Yun Hin Taufiq Yap (Universiti Putra Malaysia, MALAYSIA)
3. Assoc. Prof. Dr. Agung Nugroho (Lambung Mangkurat University, INDONESIA)
4. Assoc. Prof. Dr. Sirikantjana Thongmee (Kasetsart University, THAILAND)
5. Assoc. Prof. Dr. Mohammad Abrar Alam (United State of America, USA)

Invited Speaker

1. Assoc. Prof. Dr. Mohamad Rafi (Bogor Agricultural University, INDONESIA)
2. Assoc. Prof. Dr. Noor Haida Mohd Kaus (Universiti Sains Malaysia (USM), MALAYSIA)
3. Assoc. Prof. Dr. Akhmad Sabarudin, D.Sc. (Brawijaya University, INDONESIA)
4. Assoc. Prof. Dr. Oman Zuas (Research Center for Metrology - LIPI, INDONESIA)
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Activity Assay and Determination Protein of Amylase Enzyme Fractionate from *Amorphophallus campanulatus*

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Abstract. Amylase enzyme has been isolated and fractionated from *Amorphophallus campanulatus*. Amylase enzyme was isolated by extraction method and used blender to break open the cells release their proteins also crude extract. The step of this research was isolation of enzyme from *Amorphophallus campanulatus*, using ammonium sulphate fractionation with saturation of 0-60%, 60-70%, 70-80%, and 80-100%. The quantitative analysis of enzyme activity assay was determined by the Nelson-Somogy method and the total amount of protein concentration was determined by Lowry method and measured using UV-Vis spectrophotometer at 750 nm. The result of this research showed that the highest enzyme activity fraction of 0-60% was 1.52 mg sugar.mg protein⁻¹.minute⁻¹ and the amount of protein concentration was 27222.22 ppm.

Keywords: Amylase, *Amorphophallus campanulatus*, enzyme activity

A. Introduction

During the last three decades, amylases have been exploited by the starch-processing industry as a replacement of acid hydrolysis in the production of starch hydrolysates. This enzyme is also used for the removal of starch in beer, fruit juices, or from clothes and porcelain. A new and recent application is maltogenic amylases as an anti-salting agent to prevent the retrograde of starch in bakery products [1]. β-amylases are also used in production of maltose syrup [2, 3]. Production of maltose syrups using these β-amylases would still require a compatible debranching enzyme [4].

In plant, β-amylase is distributed in higher plants such as soybean, sweet potato and barley [5, 6]. The properties of the β-amylase various from one source to the other [7]. The research methods consist of extraction of β-amylase from *Amorphophallus campanulatus*. The isolation and purification enzyme was conducted by fractionation with ammonium sulphate and dialysis.

B. Result and Discussion

Amylase from *Amorphophallus campanulatus* was extracted in 0.05 M acetate buffer pH 4.8 and purify with ammonium sulphate fractionation and followed with dialysis. Table 1 showed the specific activity of each fraction.

As can be seen in Table 1, Fraction A₆₀ has the highest specific activity of 0.165 mg sugar.mg protein⁻¹.minute⁻¹, were then subjected to dialysis.

Table 1. Specific activity of ammonium sulphate fractions.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Specific activity (mg sugar/mg protein/minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Extract</td>
<td>0.017</td>
</tr>
<tr>
<td>A₆₀ (0 - 60%)</td>
<td>0.165</td>
</tr>
<tr>
<td>A₇₀ (60-70%)</td>
<td>0.105</td>
</tr>
<tr>
<td>A₈₀ (70-80%)</td>
<td>0.079</td>
</tr>
<tr>
<td>A₁₀₀ (80-100%)</td>
<td>0.038</td>
</tr>
</tbody>
</table>

As can be seen in Table 2, Purification level of dialysis-purified amylase from *Amorphophallus campanulatus*.

Table 2. Purification level of dialysis-purified amylase from *Amorphophallus campanulatus*.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Specific activity (mg sugar/mg protein/minute)</th>
<th>Protein Concentration (ppm)</th>
<th>Purification (-fold)</th>
<th>Yield (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Extract</td>
<td>0.14</td>
<td>64166.65</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>D₆₀ (0 - 60%)</td>
<td>1.52</td>
<td>27222.22</td>
<td>10</td>
<td>62</td>
</tr>
</tbody>
</table>

D₆₀ = dialysis fraction 0-60%
It was showed that in Table 2, specific activity of this fraction was increased to 1.52 mg sugar.mg protein⁻¹.minute⁻¹. The specific activity of dialysis purified amylose increased as much as 10 folds for Da. It was reported that activity of Cilembu β-amylase with specific activity of 6.53 mg sugar.mg protein⁻¹.minute⁻¹ [10], whereas β-amylase from un-germinated seeds of peanut (Arachis hypogaea) was purified to apparent electrophoretic homogeneity with final purification fold of 205 and specific activity of 361 μmol.min⁻¹.mg⁻¹ protein [11]. The partially purified α-amylase was reported for Bacillus subtilis has specific activity of 0.144 U/mg [12], while this enzyme has specific activity of 6.93 U/ml [13]. It was also reported that α-amylase from Aspergillus niger has specific activity of 1.241 U/ml [14].

C. Conclusion

The result of this research showed that the highest enzyme activity fraction of 0-60% was 1.52 mg sugar.mg protein⁻¹.minute⁻¹ and the amount of protein concentration was 27222.22 ppm.

D. Experimental Section

Amorphophallus campanulatus were collected from Bengkulu city. The sample was prepared by homogenizing the washed-Amorphophallus campanulatus in 5 mM Na-acetate pH 4.8 solution containing 0.1% v/v β-mercaptoethanol (2:1 w/w), for 10 minutes. Then the crude enzyme was collected after centrifugation of the homogenate at 2500 rpm for 20 minutes. Amylase activity was determined by Somogyi-Nelson method [8] and the protein concentration was determined by Lowry method [9]. Crude enzyme was purified with ammonium sulfate fractionated at the range of 0-60%; 60-70%, 70-80% and 80%-100%. Fraction of 0-60% was further purified with dialysis. Concentration of protein for every fraction was determined using Lowry method [8].

E. Acknowledgment

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F. References