Journal of Biomedical Engineering MANUSCRIPT
ISSN: 1001-5515 Vol. 40 No. 1 (2023)

Isolation of amylase producing bacteria from soil and its optimization of production parameters by shake flask culture method

Mahavir Chhajed[1*], Priyanka Tiwari[2], Rakesh Barik[3], Amit Gangwal[4], Vrishti M. Thakur[5], Atika Chhajed[1] and Sumeet Dwivedi[5]
[1]Vidyasagar College of Pharmacy, Indore, (MP) – India
[2]Faculty of Science, SAM Global University, Raisen, (M.P.) – India
[3]GITAM School of Pharmacy, GITAM Deemed to be University, Hyderabad, (A.P.) – India
[4]Shri Vile Parle Kelavani Mandal's Institute of Pharmacy, Dhule, (MH) – India
[5]Acropolis Institute of Pharmaceutical Education and Research, Indore (M.P.) – India.

Abstract: The effects of various production parameters such as pH, temperature, incubation time and sources of carbon were tested in submerged fermentation process by shake flask culture method in production of amylase by bacteria isolated from groundnut field soil. The production medium with provision of glucose as carbon source, yeast extract as nitrogen source incubated for 48 h, maintained with pH of 6.5 at 39°C, was found optimal for production of amylase.

Keywords: amylase, shake flask culture, starch agar plate, fermentation.

1. Introduction

Enzymes are defined as biocatalysts protein in character, formed by living cells to carry out definite biochemical reactions, usually obtained from the elements of the metabolic progressions of the cell. Enzymes have extremely particular action on their specific substrates. At present 3000 enzymes are known but only few are scientifically and commercially subjugated. These are mainly extracellular hydrolytic enzymes, which degrade naturally occurring polymers such as starch, proteins, pectin's and cellulose.[1] Starch degrading amylolytic enzymes are of great significance in biotechnological applications ranging from food, textile to paper industries.[2-3] The production of amylases is overshadowing all other enzymes; hence, account 65% of enzyme market in world.[4-5]

Amylases constitute a group of enzymes that yields dextrin and numerous monomer products by hydrolysing-1,4 glycosidic linkages of starch molecules. An endo-acting enzyme, α-amylase and its hydrolyzes linkages hydrolyzes α-1,4 bonds in a unsystematic manner and bypass α-1, 6 linkages, leads to the development of linear and branched oligosaccharides and inhibit dextrins. An exo-acting enzyme, β-amylase hydrolyzes α-1, 4 by attacking the substrate from the non-reducing end and cannot bypass α-1, 6 linkages leads to the development a major end product oligosaccharide maltose which compose of 2 units of adjacent glucose. γ-Amylase (glucoamylase) is an exoacting enzyme that attacks the substrate from the non-reducing end and hydrolyzes α-1, 4 and α-1,6 linkages thus producing monosaccharides (1 unit of glucose) as a major end product.[6] Amylases are used commercially for starch liquefaction, paper, desizing of textile fabrics, in preparing starch coatings of paints, in removing wall paper, food in the brewing industry, sugar induction by production of sugar syrups from starch which consist of glucose, maltose and higher oligosaccharides, pharmaceutical and in preparing cold water dispersible laundry starches. To meet the demands of these industries low cost medium is required for the production of amylases.[7]

Source details

Feedback > Compare sources >

Shengwu Yixue Gongchengxue Zazhi/Journal of Biomedical Engineering

Scopus coverage years: from 1997 to 2016, from 2020 to Present
Publisher: Sichuan Society for Biomedical Engineering
ISSN: 1001-5515
Subject area: Medicine: General Medicine
Source type: Journal

View all documents > | Set document alert | Save to source list | Source Homepage

CiteScore 2021
0.2

SJR 2021
0.127

SNIP 2019
0.060

CiteScore | CiteScore rank & trend | Scopus content coverage

Improved CiteScore methodology
CiteScore 2021 counts the citations received in 2018-2021 to articles, reviews, conference papers, book chapters and data papers published in 2018-2021, and divides this by the number of publications published in 2018-2021. Learn more >

CiteScore 2021

$$0.2 = \frac{64 \text{ Citations } 2018 - 2021}{260 \text{ Documents } 2018 - 2021}$$

Calculated on 05 May, 2022

CiteScoreTracker 2022

$$0.5 = \frac{187 \text{ Citations to date}}{404 \text{ Documents to date}}$$

Last updated on 05 April, 2023 • Updated monthly

CiteScore rank 2021