1-Purification and characterization of xylanase from a thermophilic Streptomyces sp. K37

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Abstract

Extracellular xylanase (EC 3.2.1.8) from Streptomyces sp. K37 was purified 33.53 by ultrafiltration and cation exchange chromatography followed by gel filtration chromatography. The optimum pH and temperature for purified xylanase were found to be pH 6.0 and 60 degrees C. The Km and V (max) values of the purified xylanase were 15.4 mg ml(-1) and 0.67 micromole reducing sugar min(-1) ml(-1). High performance liquid chromatography (HPLC) gel filtration of the purified xylanase eluted xylanase activity as a peak corresponding to the molecular weight of about 24.3 kDa while the molecular weight determined by SDS-PAGE was found to be 26.4 kDa. The purified xylanase of Streptomyces sp. K37 was found to be endoxylanase and non arabinose liberating enzyme and was highly glycosylated (73.97%).

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2- Enzymes of Candida albicans cell-wall lytic system produced by Streptomyces thermodiastaticus.

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Abstract

The production of the enzymes of Candida albicans cell-wall lytic system by S. thermodiastaticus was found to be affected by some growth conditions and nutritional factors. The highest lytic activity was obtained after 18 h of incubation at pH 5.5 and an incubation temperature of 50 degrees C. The carbon source influenced the production of the enzymes of the yeast cell wall lytic system. Maximum lytic activity was obtained when Candida albicans cell-wall (1 g/100 ml) was used as the sole carbon source. NaNO3 at 0.1 g/100 ml level was the best nitrogen source for the biosynthesis of the enzymes of the yeast lytic system. From all phosphor sources, microelements, and growth factors tested, KH2PO4 (1 g/l), ZnSO4 (1 mg/l) and Tween 80 (0.1%), respectively were found to favour highest enzymes production of the lytic system. The Candida albicans cell-wall lytic system produced by S. thermodiastaticus mainly contained chitinolytic and proteolytic activities.

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3- Candida albicans cell wall lytic enzyme produced by Streptomyces thermodiastaticus

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Abstract

The production of lytic enzyme by Streptomyces thermodiastaticus was found to be affected by some growth conditions and nutritional factors. The highest enzyme production was obtained after 18 h of incubation at pH 5.5 and at 50 degreesC. The carbon source influenced the lytic enzyme production. A higher enzyme yield was obtained when Candida albicans cell wall (1 g/100 mi) was used as the sole carbon source. NaNO3 at 0.1 g/100 mi was the best nitrogen source for enzyme production. From all phosphorous sources, microelements, and growth factors tested, KH,PO, (1 g/l), ZnSO4(1 mg/l) and Tween 80 (0.1%), respectively, were found to favour the highest production of lyric enzymes by S. thermodiastaticus. The lytic enzymes mainly produced chitinolytic and proteolytic activities.

Keywords: Streptomyces thermodiastaticus; lytic enzyme; Candida albicans; chitinase; protease

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4- Use of microorganisms for improvement of Egyptian kaolins ceramic properties

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Abstract

The present study showed that the proper treatment of kaolins by microrganisms can be a possible way to improve their ceramic properties and hence to meet the requirements of the line ceramic industry. Fungi culture cultivated in the presence of different poor kaolin samples improved their densification parameters, whiteness, workability and mechanical strength.

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Refrences

1. Title: INFLUENCE OF ENGORGEMENT ON MICROBIAL ALTERATION OF MINERALS IN SOILS
Author(s): BERTHELIN, J; KOGBLEVI, A
Source: REVUE D ECOLOGIE ET DE BIOLOGIE DU SOL Volume: 11 Issue: 4 Pages: 499-509 Published: 1974

2. Title: IMMUNE STATUS OF PATIENTS WITH POSTBURN ESOPHAGEAL STRICTURES
Author(s): CHERNOUSOV, AF; BOGOMOLOVA, NS; ANDRIANOV, VA; et al.
Source: SOVETSKAYA MEDITSINA Issue: 10 Pages: 20-24 Published: 1988

3. Title: [not available]
Author(s): DACEY PW
Source: 380 WARR SPRING LAB Published: 1981

4. Title: [not available]
Author(s): DITZ H
Source: FORCHUNGSBERICHTE DK Volume: 2 Pages: 211 Published: 1986

5. Title: [not available]

Author(s): GROUDEV SN
Source: BIOHYDROMETALLURGY Volume: 3 Published: 1994

6. Title: [not available]
Author(s): GROUDEV SN
Source: BIOTECHNOL BIOENG S Volume: 16 Pages: 91 Published: 1986

6. Title: [not available]
Author(s): GROUDEV SN
Source: HYDROMETALLYRGY Volume: 2 Pages: 278 Published: 1985

8. Title: [not available]
Author(s): GROUDEV SN
Source: J MINERAL BIOTECHNOL Volume: 56 Pages: 1543 Published: 1991

9. Title: [not available]
Author(s): GROUDEV SN
Source: 2 WORLD C NONM MIN B Published: 1989

10. Title: [not available]
Author(s): GROUDEVA VI
Source: P 5 INT C ICSOBA ZEG Published: 1983

11. Title: [not available]
Author(s): GROUDEVA VI
Source: 3 EUR SOC C MADR SPA Published: 1993

12. Title: 3958982 Patent Number: US 3958982
Inventor/Assignee: HUANG WH

13. Title: STRENGTH AND ELASTICITY OF WHITEWARES .I. RELATION BETWEEN FLEXURAL STRENGTH AND ELASTICITY
Author(s): KALNIN, IL
Source: AMERICAN CERAMIC SOCIETY BULLETIN Volume: 46 Issue: 12 Pages: 1174-& Abstract Number: A1968-17733 Published: 1967

14. Title: [not available]
Author(s): KALNIN IL
Source: CERAM B Volume: 47 Pages: 498 Published: 1968

15. Title: [not available]
Author(s): KAMPFER S
Source: TILE BRICK INT Volume: 7 Pages: 229 Published: 1991

16. Title: [not available]
Author(s): KROMER H
Source: SCI CERAM Volume: 14 Pages: 113 Published: 1988

17. Title: EFFECT OF ENVIRONMENTAL PARAMETERS ON THE EFFICIENCY OF BIODEGRADATION OF BASALT ROCK BY FUNGI
Author(s): MEHTA, AP; TORMA, AE; MURR, LE
Source: BIOTECHNOLOGY AND BIOENGINEERING Volume: 21 Issue: 5 Pages: 875-885 DOI: 10.1002/bit.260210510 Published: 1979

18. Title: [not available
]Author(s): NAGA SM
Source: EGYPT J APPL SCI Volume: 9 Pages: 235 Published: 1994

19. Title: [not available]
Author(s): ROUXET P
Source: S CATH U LOUV BELG 5 Published: 1990

20. Title: [not available]
Author(s): STAROSTA J
Source: P 12 M MIN MET BOR Volume: 11 Pages: 385 Published: 1980

21. Title: [not available]
Author(s): TORMA AE
Source: BIOHYDROMETALLURGICA Volume: 2 Published: 1993

22. Title: [not available]
Author(s): TORMA AE
Source: BIOHYDROMETALLURGICA Volume: 1 Published: 1993

23. Title: [not available]
Author(s): TORU H
Source: CHEM ABSTR Volume: 114 Published: 1991

24. Title: 44451 Patent Number: BU 44451
Inventor/Assignee: VASSILEV CD

25. Title: [not available]
Author(s): VERGES V
Source: IND CERAMIQUE Pages: 7220 Published: 1986

26. Title: 119784 Patent Number: JP 119784

5- Effect of the culture filtrates of Streptomyces on growth and productivity of wheat plants

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Abstract

Streptomyces olivaceoviridis;, S. rimosus and S. rochei proved to possess a high capacity for the production of auxins, gibberellins and cytokinin-like substances, together with substantial levels of alpha-amylase and proteinase. Grain priming with culture filtrates of S. olivaceoviridis, S. rimosus or S. rochei appeared to enhance growth vigor and crop yield of wheat plants. In the majority of cases, the culture filtrate of S. olivaceoviridis appeared to be the most effective in this respect. The present results are discussed in relation to the indirect role played by these bacteria in producing plant growth-regulating substances and their effects on growth and yield of wheat.

KeyWords: AZOSPIRILLUM-BRASILENSE; SUBSTANCES; ROOTS

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References

1. Anson M.L.: Estimation of pepsin, trypsin, papain and cathepsin with hemoglobin.*Gen. Physiol.* **22**, 79–81 (1938).

2. Azcon R., Barea J.M.: Synthesis of auxins, gibberellins and cytokinins by*Azotobacter vinelandii* and*Azotobacter beijerinckii* related to effect produced on tomato plants.*Plant & Soil* **43**, 609–619 (1975).

3. Barbieri P.T., Zanelli E.G., Zanetti G.: Wheat inoculation with*Azospirillum brasilense* SP6 and some mutants altered in nitrogen fixation and indole-3-acetic

acid production.*FEMS Microbiol. Letters* **36**, 87–90 (1986).

4. Bell D.J.: Mono- and oligosaccharides and acidic monosaccharide derivatives, pp. 1–54 in K. Peach, M.V. Tracey (Eds):*Modern Method of Plant Analysis*. Springer-Verlag, Berlin 1955.

5. Biswas A.K., Choudhuri M.A.: Growth performance source-sink relationship and yield of rice as modified by nutrient and hormone sprays. II.*Riso* **27**, 257–268 (1978).

6. Daham H., Sitek J.M., Strzelczky E.: Synthesis of auxins by bacteria isolated from the roots of pine seedlings with rusty forest soil.*Polish J. Soil. Sci.* **10**., 131–135 (1977).

7. Degani Y., Atsmon D., Halvey A.H.: DNA synthesis and hormone-induced elongation in cucumber hypocotyle.*Nature* **225**, 554–555 (1970).

8. El-Shanshoury A.R.: Growth promotion of wheat seedlings by*Streptomyces atroolivaceus*.*J. Agron. Crop Sci.* **163**, 109–114 (1989).

9. El-Shanshoury A.R., Hamada E.A.M.: Interaction between sodium chloride and*Streptomyces atroolivaceus* and their effects on maize (*Zea mays* L. dihybrid 204).*Delta J. Sci.* **12**, 71–78 (1988).

10. El-Shanshoury M.N., Malibari A.: Effect of PEG stress mycorrhiza on growth and mineral uptake of barley and soybean.*J. Agron. Crop. Sci.* **161**, 333–338 (1988).

11. El-Shanshoury M.N., El-Sayed M.A., El-Shanshoury A.R.: Inoculation of soil with*Azotobacter chroococcum*.*Egypt. J. Bot.* **3**, 205–214 (1979).

12. Esashi Y., Leopold A.C.: Cotyledon expansion as a bioassay for cytokinins.*Plant Physiol.* **56**, 618–620 (1969).

13. Foda H.A., Radwan S.S.: Straight growth test for hormones and inhibitors using coleoptile of some Egyptian gramineous.*Ain Shams Sci. Bull.* **8**, 381–399 (1962).

14. Frankland B., Wareing P.E.: Effect of gibberellic acid on hypocotyl growth of

lettuce seedling.*Nature* **23**, 255–256 (1960).

15. Galson A.W., Davies P.J.:*Gibberellins, in Control Mechanisms in Plant Development*. Prentic-Hall, New Jersey 1970.

16. Hamedo H.M.: Studies on hormonal activities of some bacteria. MSc Thesis.*Faculty of Science, Mansoura University*, Mansoura (Egypt) 1991.

17. Herzog H., Geisler G.: Effect of cytokinin application on the tillering and organogenesis of the ear of spring wheat.*Z. Pflanzenbau* **144**, 8–17 (1976).

18. Jain D.K., Patriquin D.G.: Characterization of a substance produced by*Azospirillium* which causes branching of wheat root hairs.*Can. J. Microbiol.* **31**, 206–210 (1985).

19. Kampert M., Strzelczyk E.: Effect of pH on production of cytokinin-like substances by bacteria isolated from soil, rhizosphere and mycorrhizosphere of pine (*Pinus silvestris* L.).*Acta Microbiol. Polon.* **33**, 77–85 (1984).

20. Kenede H., Gardner G.: Hormone binding in plants.*Ann. Rev. Plant. Physiol.* **27**, 267–290 (1976).

21. Koaze Y.: Germination promotant for plants seed, produced by microorganisms.*Bull. Agr. Chem. Soc. Japan* **22**, 91–97 (1958).

22. Lin W., Okon Y., Hardy R.W.F.: Enhanced mineral uptake by*Zea mays* and*Sorghum bicolor* roots inoculated with*Azospirillum brasilense*.*Appl. Environ. Microbiol.* **45**, 1775–1779 (1983).

23. Mansour F.A., Aldesuquy H.S., Hamedo H.A.: Studies on the plant growth regulators and enzymes production by some bacteria.*Qatar Univ. Sci. J.* **14**, 281–288 (1994).

24. Muting D., Kaiser E.: Spectrophotometric method of determining of α-amino-N in biological materials by means of the ninhydrin reaction.*Hoppe-Seyler's Z. Physiol. Chem.* **323**, 276 (1963); quoted from*Clinical Laboratory*, 11th ed. of Medico-chemical Investigation Methods. E. Merck, Darmstadt, Germany.

25. Okon Y., Kapulnik Y.: Development and function of*Azospirillum*-inoculated roots.*Plant & Soil* **90** 3–16 (1986).

26. Ray S., Choudhurt M.A.: Regulation of flag leaf senescence in rice by nutrient and its impact on yield. II.*Riso* **29**, 9–14 (1980).

27. Shindy W.W., Smith O.E.: Identification of plant hormones from cotton, ovules.*Plant Physiol.* **55**, 550–554 (1975).

28. Snedecor G.W., Cochran W.G.:*Statistical methods*, 6th ed. Oxford and IBH Publishign Co., New Delhi 1967.

29. Tien T.M., Gaskins M.H., Hubbell D.H.: Plant growth substances produced by*Azospirillium brasilense* and their effect on the growth of pearl millet (*Pennisetum americanum* L.).*Appl. Environ. Microbiol.* **37**, 1016–1024 (1979).

30. Yemm E.W., Willis A.J.: The respiration of barley plants. IX. The metabolism of roots during the assimilation of nitrogen.*New Phytol.* **55**, 229–252 (1956).

31. Younis A.E., Younis M.E., Gabr M.A.: Studies on the effect of certain enzymic poisons on the metabolism of storage organs. II. Differential effects of iodoacetate on the respiration metabolism and permeability barriers in radish root slices.*Plant Cell Physiol.* **10**, 95–101 (1969).