Production of endoxylananase from novel Actinomadura geliboluensis by using agricultural wastes

Ali Osman Adıgüzel, Münir TUNÇER
Mersin University, Department of Biology

CYPRUS 2016
4th International Conference on Sustainable Solid Waste Management
Suitable fermentation medium for endoxylanase production from A. geliboluensis

Figure. Time course of endoxylanase production from A. geliboluensis in MS-YEM, Horikoshi, ISP2 liquid, Nutrient Broth and Minimal Medium supplemented with 0.5% (w/v) birchwood xylan. Incubation was performed at 30 °C, 200 rpm.
Suitable carbon sources for endoxylanase production

**Figure.** Effect of different lignocellulosic carbon sources (5 g/L) such as lentil straw (LS), banana leaf (BL), barley straw (BS), wheat straw (WS), corn stover (CS), castor oil plant stalk (COPS) and pine needle (PN) on endoxylanase production from *A. geliboluensis* in MS-YEM. Incubation was performed at 30 °C, 200 rpm for 3 days.
Improvement of endoxylanase production from A. geliboluensis by using wheat straw as primary carbon source
Effect of particle size of wheat straw on endoxylanase production from *A. geliboluensis*

Figure. Effect of particle size of wheat straw (5 g/L) on endoxylanase production from *A. geliboluensis* in MS-YEM. Incubation was performed at 30 °C, 200 rpm for 3 days.
Effect of nitrogen sources on endoxygenase production from *A. Geliboluensis* by using wheat straw as primary carbon source

Figure. Effect of nitrogen sources on endoxylanase production from *A. geliboluensis* in MS-YEM supplemented with wheat straw. Incubation was performed at 30 °C, 200 rpm for 3 days. (ASP: asparagine, GLY: glycine, CS: casein, PT: peptone, YE: yeast extract, SM: soybean meal, UR: urea, GL: gelatin)
Effect of temperature and initial pH of media on endoxylanase production from A. Geliboluensis by using wheat straw as primary carbon source

Figure. Effect of temperature and initial pH of media on endoxylanase production from A. geliboluensis in MS-YEM. Incubation was performed at 30 °C, 200 rpm for 3 days.
Effect of agitation on endoxylanase production from *A. Geliboluensis* by using wheat straw as primary carbon source

**Figure.** Effect of agitation on endoxylanase production from *A. geliboluensis* in MS-YEM. Incubation was performed at 30 °C for 3 days. Initial media pH was 6.0
Improvement of endoxylanase production from A. geliboluensis by using corn stover as primary carbon source
Effect of particle size of corn stover on endoxylanase production from *A. geliboluensis*

**Figure.** Effect of particle size of corn stover (5 g/L) on endoxylanase production from *A. geliboluensis* in MS-YEM. Incubation was performed at 30 °C, 200 rpm for 3 days.
Effect of nitrogen sources on endoxylanase production from A. geliboluensis by using corn stover as primary carbon source

Figure. Effect of nitrogen sources on endoxylanase production from A. geliboluensis in MS-YEM supplemented with corn stover. Incubation was performed at 30 °C, 200 rpm for 3 days. (ASP: asparagine, GLY: glycine, CS: casein, PT: peptone, YE: yeast extract, SM: soybean meal, UR: urea, GL: gelatin)
Effect of temperature and initial pH of media on endoxylanase production from A. Geliboluensis by using corn stover as primary carbon source

**Figure.** Effect of temperature and initial pH of media on endoxylanase production from *A. geliboluensis* in MS-YEM. Incubation was performed at 30 ºC, 200 rpm for 3 days.
Effect of agitation on endoxylanase production from *A. Geliboluensis* by using *corn stover* as primary carbon source

![Graph showing the effect of agitation on endoxylanase production](image)

**Figure.** Effect of agitation on endoxylanase production from *A. geliboluensis* in MS-YEM. Incubation was performed at 30 °C for 3 days. Initial media pH was 7.0
Improvement of endoxylanase production from A. geliboluensis by using castor oil plant (Ricinus communis) as primary carbon source
Effect of particle size of castor oil plant on endoxylanase production from A. geliboluensis

Figure. Effect of particle size of castor oil plant (5 g/L) on endoxylanase production from A. geliboluensis in MS-YEM. Incubation was performed at 30 °C, 200 rpm for 3 days.
Effect of nitrogen sources on endoxylanase production from A. geliboluensis by using castor oil plant as primary carbon source

**Figure.** Effect of nitrogen sources on endoxylanase production from *A. geliboluensis* in MS-YEM supplemented with castor oil plant. Incubation was performed at 30 °C, 200 rpm for 3 days. (ASP: asparagine, GLY: glycine, CS: casein, PT: peptone, YE: yeast extract, SM: soybean meal, UR: urea, GL: gelatin)
Effect of temperature and initial pH of media on endoxylanase production from A. geliboluensis by using castor oil plant as primary carbon source

Figure. Effect of temperature and initial pH of media on endoxylanase production from A. geliboluensis in MS-YEM. Incubation was performed at 30 °C, 200 rpm for 3 days.
Effect of agitation on endoxylanase production from *A. Geliboluensis* by using *castor oil plant* as primary carbon source

**Figure.** Effect of agitation on endoxylanase production from *A. geliboluensis* in MS-YEM. Incubation was performed at 30 °C for 3 days. Initial media pH was 6.0
Extracellular protein profile of *A. geliboluensis* fermentation broths

**Figure.** SDS-PAGE profile of extracellular proteins in fermentation liquid after incubation of *A. geliboluensis* by using wheat straw (L1), corn stover (L2) and castor oil plant (L3) in MS-YEM. Molecular marker (M) included carbonic anhydrase (29 kDa), egg albumin (45 kDa), bovine albumin (66 kDa), rabbit phosphorylase b (97.4 kDa) and β-galactosidase (116 kDa).
**Zymogram analysis of A. geliboluensis fermentation broths**

**Figure.** Native-PAGE and zymography of extracellular proteins in fermentation liquid after incubation of *A. geliboluensis* by using wheat straw (a₁: native PAGE, a₂: zymography), corn stover (b₁: native PAGE, b₂: zymography) and castor oil plant (c₁: native PAGE, c₂: zymography) in MS-YEM.