

*Fomitopsis pinicola*에서 Thiamine 증가에 따른 b-glucosidase 생산

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Thiamine increases b-glucosidase production in the newly isolated strain of *Fomitopsis pinicola*

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Objectives

To isolate a high b-glucosidase (BGL)-producing strain and to optimize BGL production in the isolated strain

Materials and Methods

A high BGL-producing strain was isolated and identified as *Fomitopsis pinicola* KMJ812 based on its morphology and a comparison of sequence of its internal transcribed spacer rDNA gene. To increase BGL production, *F. pinicola* was supplemented with various vitamins. Supplementation with thiamine (20 mg l⁻¹) improved BGL production in *F. pinicola* cultures. The increased production of BGL in the thiamine-supplemented culture was confirmed by two-dimensional electrophoresis followed by MS/MS sequencing

Results

Supplementation with thiamine (20 mg l⁻¹) improved BGL production in *F. pinicola* cultures by 3.7-fold to give a specific activity of 114.4 mmol min⁻¹ mg-protein⁻¹, one of the highest among BGL-producing microorganisms. The increased production of BGL in the thiamine-supplemented culture was confirmed by two-dimensional electrophoresis followed by MS/MS sequencing. The BGL purified from *F. pinicola* culture showed the highest catalytic efficiency ever reported.

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시험성적

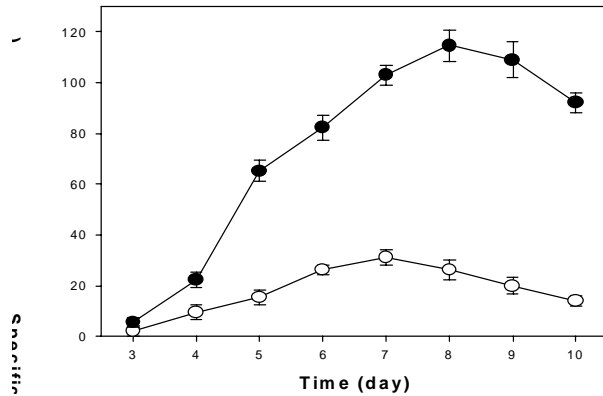


Figure 1 Effect of thiamine supplementation on the specific activity of BGL in *F. pinicola* culture. Cultivation of *F. pinicola* KMJ812 was performed for 10 days in a 7 l fermenter. Cultivation temperature and rpm were controlled as 27°C and 200 rpm, respectively. BGL production in culture without supplementation (○), culture with thiamine 20 mg l⁻¹ (●).

Table 1 Effect of various vitamins on the specific activity of BGL in a flask culture of *F. pinicola*

Vitamins (mg l ⁻¹)	0	1	5	10	20	30	50
	b-Glucosidase (U mg ⁻¹ protein ⁻¹)						
Control	12.5						
Biotin		8.2	7.9	5.6	0.6	-	-
Calcium pantothenate		12.8	9.8	8.4	6.7	5.9	5.4
Folic acid		11.9	12.8	15.9	17.6	17.3	16.6
Inositol		12.6	16.5	16.7	11.4	2.1	2.0
Pyridoxine hydrochloride		4.6	1.6	-	-	-	-
Riboflavin		13.8	15.2	16.6	17.1	16.0	12.8
Thiamine		18.8	25.1	65.0	71.3	35.9	25.8