

Supplementary table 1. Comparison with the enzymatic properties of recombinant *TmGluI* and native *TmGLA*

	<i>TmGluI</i> (Expressed in <i>P. pastoris</i>)	<i>TmGLA</i> (Isolated from <i>T. matsutake</i> NBRC 30605)
Molecular mass (SDS-PAGE)	65.0 kDa	63.9 kDa
Soluble starch degradation (1.0%, pH 5.0, 60min)	10.3 units/mg	13.9 unit/mg
pH stability (37°C, 30min)	4.0~6.0	4.0~6.0
Optimal pH (37°C,30min)	5.0	5.0
Thermal stability (pH 5.0, 30min)	~50°C	~50°C
Optimal temp. (pH 5.0、 30min)	60°C	60°C
Inducer	(5mM) Ca ²⁺ , Mn ²⁺	(5mM) Ca ²⁺ , Mn ²⁺
Inhibitor	(5mM) Ag ⁺ , Hg ²⁺ , Fe ²⁺	(5mM) Ag ⁺ , Hg ²⁺ , Fe ²⁺

Supplementary table 2. Substrate specificity of recombinant *TmGluI* and native *TmGLA*

Substrates	<i>TmGluI</i> (Expressed in <i>P. pastoris</i>)		<i>TmGLA</i> (Isolated from <i>T. matsutake</i> NBRC 30605)	
	Relative activity (%)	Specific activity (units/mg protein)	Relative activity (%)	Specific activity (units/mg protein)
1.0% Soluble starch	100	10.31	100	13.88
Amylose A (M.W. 2,900)	146	14.23	139	19.30
Amylose B (M.W. 16,000)	117	11.36	90	12.50
Isomaltooligosaccharide	105	10.23	95	13.19
Amylopectin	99	9.65	92	12.77
Pullulan	95	9.21	95	13.19
Glycogen	51	5.26	49	6.81
Corn starch	33	3.20	35	4.86
10mM Maltopentaose	83	8.67	74	10.27
Maltotetraose	73	7.65	65	9.02
Maltotriose	56	5.82	52	7.22
Maltose	15	1.60	16	2.22
Isomaltose	10	1.05	7	1.04
β -cyclodextrin	ND	ND	ND	ND
α -cyclodextrin	ND	ND	ND	ND
Trehalose	ND	ND	ND	ND
Kojibiose	ND	ND	ND	ND
Nigerose	ND	ND	ND	ND

ND, not detected