1		Novel bacterial myrosinases to be used in the preparation of
2		isothiocyanates.
3		許芷菱 (5121)
4		2023/03/15
5		Outline
6	1.	Introduction
7	2.	Characterization of a Novel Myrosinase with High Activity from Marine
8		Bacterium Shewanella baltica Myr-37
9	3.	Biochemical Characterization of a Novel Myrosinase Rmyr from Rahnella
10		inusitata for High-Level Preparation of Sulforaphene and Sulforaphane
11	4.	Conclusion
12		Abstract
13		Myrosinase can hydrolyze glucosinolates to generate isothiocyanates, which have
14	a v	ariety of excellent biological activities. To further improve the efficiency of
15	isot	hiocyanates preparation, it is necessary to explore novel sources of myrosinases. It
16	is re	eported that Shewanella baltica Myr-37, isolated from marine mud, was capable of
17	pro	ducing a novel myrosinase (Smyr37), with a molecular weight of 100 kDa. Another
18	stuc	ly indicated that a novel myrosinase Rmyr (69 kDa) originally from Rahnella
19	inus	sitata was heterologously expressed in Escherichia coli. Smyr37 showed the highest
20	acti	vity at 50°C and pH 8.0. The sinigrin- and glucoraphanin-hydrolyzing activities of
21	Sm	yr37 were determined to be 6.95 and 5.87 U/mg, respectively. Additionally, the
22	puri	ified Rmyr showed the highest activity at 40°C and pH 7.0, and has a half-life of 12
23	day	s at 30°C. The sinigrin-, glucoraphenin-, and glucoraphanin-hydrolyzing activities
24	of F	Rmyr were 12.73, 4.81, and 6.99 U/mg, respectively. Moreover, the crude enzyme
25	of S	Smyr37 could efficiently degrade glucoraphanin into sulforaphane within 25 min
26	and	its corresponding conversion efficiency was 89%. And Rmyr could efficiently
27	deg	rade the radish seed-derived glucoraphenin and the broccoli seed-derived
28	gluc	coraphanin into sulforaphene and sulforaphane within 10 min. The highest
29	con	version efficiencies of sulforaphane from glucoraphanin and sulforaphene from
30	gluc	coraphenin reached up to 92.48 and 97.84%, respectively. Therefore, Smyr-37 and
31	Rm	yr are novel biocatalysts for efficient and large-scale preparation the products of
32	gluc	cosinolates.

1	Reference
2	Wang, L. L., Jiang, H., Qiu, Y. J., Dong, Y. Y., Hamouda, H. I., Balah, M. A., & Mao,
3	X. Z. (2022). Biochemical Characterization of a Novel Myrosinase Rmyr from
4	Rahnella inusitata for High-Level Preparation of Sulforaphene and Sulforaphane.
5	Journal of Agricultural and Food Chemistry, 70(7), 2303-2311
6	Ye, Q. W., Fang, Y. W., Li, M. J., Mi, H. Y., Liu, S., Yang, G., Lu, J., Zhao, Y. L., Liu,
7	Q. T., Zhang, W., & Hou, X. Y. (2022). Characterization of a Novel Myrosinase
8	with High Activity from Marine Bacterium Shewanella baltica Myr-37.
9	International Journal of Molecular Sciences, 23(19)