

Table S1. Comparison of the properties of rAga3420 and other GH50 agarases

Family	Bacterium	Isolation sites	Protein name	Optimal temperature (°C)	Optimal pH	Cold-adapted property	Reference
GH50	<i>V.natriegens</i> WPAGA4	Deep-sea sediment	Aga3420	40	7.0	0°C; >40%	This study
GH50	<i>Agarivorans albus</i> YKW-34	Turban shell	AgaA34	40	8.0	10°C; >20%	1
GH50	<i>A. gilvus</i> WH0801	Seaweed	AgWH50A	30	6.0	20°C; >20%	2
GH50	<i>A. gilvus</i> WH0801	Seaweed	AgWH50C	30	6.0	20°C; >10%	3
GH50	<i>A. sp.</i> JAMB-A11	Sediment	AgaA11	40	7.5-8.0	20°C; 20%	4
GH50	<i>Paenibacillus agarexedens</i> BCRC 16000	Soil	AgaB-4	55	6.0	20°C; >40%	5
GH50	<i>Pseudoalteromonas</i> sp. NJ21	Sediment	Aga21	30	8.0	10°C; >85%	6
GH50	<i>Saccharophagus degradans</i> 2-40	Marine bacterium	Aga50D	30	7.0	20°C; >80%	7
GH50	<i>Streptomyces coelicolor</i> A3(2)	Soil	DagB	40	7.0	20°C; 20%	8
GH50	<i>Victivallis vadensis</i> ATCC BAA-548	Human fecal	VadG925	40, 60	7.0	4°C; >20%	9

N.D. not determined

Table S2. The values of ANI and DDH of *Vibrio natriegens* WPAGA4 with other *Vibrio* species.

Bacterium	ANI	dDDH
<i>V. natriegens</i> NBRC 15636	98.23	84.6
<i>V. chemaguriensis</i> Iso1	80.74	23.4
<i>V. hyugaensis</i> 090810a	80.56	22.3
<i>V. diabolicus</i> CNCM I-1629	79.65	23.4
<i>V. inhibens</i> CECT 7692	79.51	22.6
<i>V. communis</i> LMG 25430	79.00	22.7
<i>V. jasicida</i> CAIM 1864	76.97	22.6
<i>V. campbellii</i> CAIM 519	76.67	22.8
<i>V. nereis</i> NBRC 15637	74.44	22.4

Table S3. The dbCAN annotation result of the 4 putative agarase genes

Gene ID	EC#	GH family	Amino acid location of the domain
aga3418	3.2.1.81	GH50	281-963
aga3419	3.2.1.81	GH50	251-919
aga3420	3.2.1.81	GH50	270-948
aga3421	3.2.1.81	GH50	69-739

Table S4. The primer pairs for the putative agarase gene amplification

Gene ID	Forward primer (5'-3')	Reverse primer (5'-3')
aga3418	GCTACAAAAACACCAGACACATCC	TTTGTTAATAGATCCGAATCGTCG
aga3419	TCAACGTTAGTGACTTCTTTTGAAAG	TGATACGTATTTTCTACGTACCCATC
aga3420	TGTC AATCGACGACAGGATC	TTTAAAGCGGTTGTTATAGAGGTTTG
aga3421	ACACCAACTATAAATGATGTGGT TAG	CTTATAACGCCGTTTATACATACAGC



Fig. S1. The dbCAN annotation result of aga3420

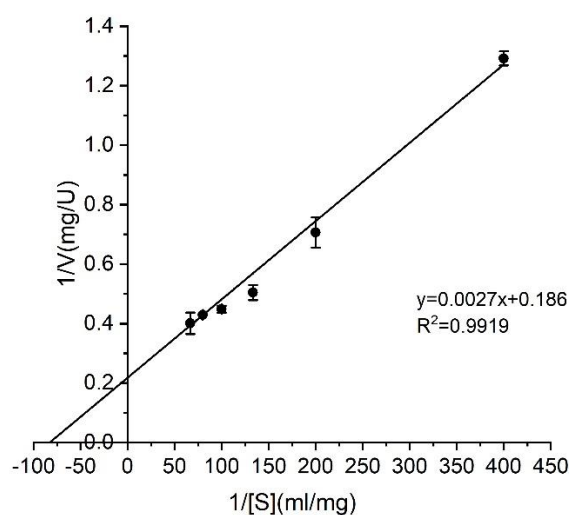


Fig. S2. Lineweaver-Burk plot of the kinetic parameter determination of rAga3420

References

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