

## Supplementary Material

### Supplementary Table Legends

**Supplementary Table S1** Bioinformatics Prediction of Antibacterial Peptides from *Pinctada fucata* (A. Gould, 1850)

Serial number	UniProt Accession Numbers	Protein names	Length (aa)	CAMPR <sub>3</sub>
1	A0AA89C164	Uncharacterized protein	54	AMP
2	A0AA88XVN3	Uncharacterized protein	58	AMP
3	A0AA88XVN3	Uncharacterized protein	64	AMP
4	A0AA89BRA6	Uncharacterized protein	64	AMP
5	A0AA88XZM5	Uncharacterized protein	68	AMP
6	A0AA89BNT2	Uncharacterized protein	72	AMP
7	A0AA88XNL8	Uncharacterized protein	78	AMP
8	A0A194AL40	Uncharacterized protein	79	AMP
9	A0A194ALE0	Uncharacterized protein	79	AMP
10	A0A194APD2	Uncharacterized protein	79	AMP
11	A0AA89CCB6	Uncharacterized protein	79	AMP
12	A0A194ANK0	Uncharacterized protein	80	AMP
13	L8B2Q5	Uncharacterized protein	81	81
14	A0A194AKN3	Uncharacterized protein	82	AMP
15	A0AA88XWB6	Uncharacterized protein	82	AMP
16	A0A194ALV1	Uncharacterized protein	83	AMP
17	A0A194ANN4	Uncharacterized protein	83	AMP
18	A0AA88Y172	Uncharacterized protein	84	AMP
19	A0AA88YHX8	Uncharacterized protein	84	AMP
20	A0AA88YLU7	Uncharacterized protein	85	AMP
21	A0AA89BKC8	Uncharacterized protein	85	AMP
22	A0AA89BUQ5	Uncharacterized protein	85	AMP
23	A0AA88Y524	Uncharacterized protein	86	AMP
24	A0AA88YUN7	Uncharacterized protein	87	AMP

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25	A0AA89BX46	Uncharacterized protein	87	AMP
26	A0A194ANZ1	Uncharacterized protein	88	AMP
27	A0AA88YRQ0	Uncharacterized protein	88	AMP
28	A0AA89C4L7	Uncharacterized protein	88	AMP
29	A0A194APR2	Uncharacterized protein	90	AMP
30	A0AA89C1W0	Uncharacterized protein	90	AMP
31	A0AA88XCQ7	Uncharacterized protein	91	AMP
32	A0AA88Y7V4	Uncharacterized protein	91	AMP
33	A0AA88Y8M1	Uncharacterized protein	91	AMP
34	A0AA89BQ63	Uncharacterized protein	91	AMP
35	A0AA89C5B8	Uncharacterized protein	91	AMP
36	A0AA89CBU8	Uncharacterized protein	91	AMP
37	A0AA88YFB6	Uncharacterized protein	92	AMP
38	A0AA88YLG8	Uncharacterized protein	92	AMP
39	A0AA88YR87	Uncharacterized protein	92	AMP
40	A0AA89C8J7	Uncharacterized protein	92	AMP
41	L8B367	Uncharacterized protein	92	AMP
42	A0AA88YB81	Uncharacterized protein	93	AMP
43	A0AA88YB81	Uncharacterized protein	94	AMP
44	A0A194ANS9	Uncharacterized protein	95	AMP
45	A0AA88XD04	Uncharacterized protein	95	AMP
46	A0A194AJI4	Uncharacterized protein	96	AMP
47	A0AA88Y9H7	Uncharacterized protein	96	AMP
48	A0AA89C1S0	Uncharacterized protein	96	AMP
49	A0AA88XLE1	Uncharacterized protein	97	AMP
50	A0AA88XPE4	Uncharacterized protein	97	AMP
51	A0AA88XRL7	Uncharacterized protein	97	AMP
52	A0AA88YQM4	Uncharacterized protein	98	AMP
53	A0A194AP46	Uncharacterized protein	99	AMP

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54	A0AA88XXT5	Uncharacterized protein	99	AMP
55	A0AA88YHD2	Uncharacterized protein	99	AMP
56	A0AA88YV66	Uncharacterized protein	99	AMP
57	A0AA89BR89	Uncharacterized protein	99	AMP
58	A0AA89BYQ8	Uncharacterized protein	99	AMP
59	A0AA88YHP8	Uncharacterized protein	100	AMP
60	F7J4X3	Uncharacterized protein	108	AMP
61	A0A194APC7	Uncharacterized protein	114	AMP
62	A0A194ANK2	Uncharacterized protein	115	AMP

**Supplementary Table S2** The primers used in this study.

Serial number	UniProt Accession	Sequences	Size (bp)
	Number		
F1	F7J4X3	5'-CGGAATTCATGTACAGGGTAATAGTTCTAC-3'	327
R1		5'-CCGCTCGAGCCAATATCTTCTAGAGCACTC-3'	
F2	A0A194APC7	5'-CGGAATTCATGGCATCAGCTGATATATC-3'	345
R2		5'-CCGCTCGAGATTCCTTGTATTGCATGAAC-3'	
F3	A0A194AL40	5'-CGGAATTCATGAAGCTGTTATTTTCGTTTTAG-3'	240
R3		5'-CCGCTCGAGATGGATGTTACAAGTATGGCATC-3'	
F4	A0A194ANK2	5'-CGGAATTCATGGCAGCAAGTGATATATC-3'	348
R4		5'-CCGCTCGAGATTCCTTGTATTGCATGAAC-3'	
F5	L8B367	5'-CGGAATTCATGGCAGGAGCTCTGAATATC-3'	279
R5		5'-CCGCTCGAGGACTTTGTTAATGATTAGCTTTC-3'	
F6	A0A194ALV1	5'-CGGAATTCATGGAAAATATACACAGTTTTTATC-3'	252
R6		5'-CCGCTCGAGCAAGTCAAAAAGAAGTTTAGATG-3'	
F7	A0A194ANS9	5'-CGGAATTCATGAAGATTCTCCTTATCTTGC-3'	287
R7		5'-CCGCTCGAGCTGGTGAGTGCATACACAAATTC-3'	
F8	A0A194AP46	5'-CGGAATTCATGCTAAGGATGGATCGAATTAC-3'	300
R8		5'-CCGCTCGAGTGGTTTCTTACACGCACACTG-3'	



## Supplementary Figure Legends

**Supplementary Figure S1** Screening for antibacterial peptides from *Pinctada fucata* (A. Gould, 1850) by RT-PCR

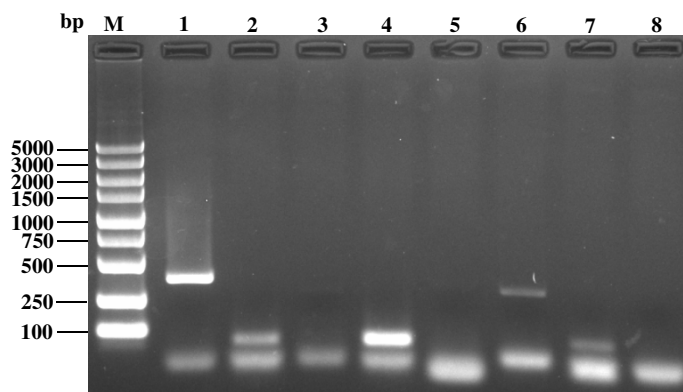


Figure S1. Screening for antibacterial peptides from *Pinctada fucata* (A. Gould, 1850) by RT-PCR. The UniProt Accession Number of No. 1 is F7J4X3. Subsequently, we named this gene *PFL-96*, and relevant work has been published [1]. The UniProt Accession Numbers 2-8 are A0A194APC7, A0A194AL40, A0A194ANK2, L8B367, A0A194ALV1, A0A194ANS9, and A0A194AP46.

## Abbreviations

PFAP-1: a novel bioactive protein from *Pinctada fucata*; ACE2: Angiotensin-Converting Enzyme II; IPTG: isopropyl- $\beta$ -d-thiogalactoside; MRSA: methicillin-resistant *Staphylococcus aureus*; MIC: minimum inhibitory concentration; MBC: minimum bactericidal concentration; IC<sub>50</sub>: half-maximal inhibitory concentration; DPPH: 1,1-diphenyl-2-picryl-hydrazyl radical; HepG2: hepatocellular carcinomas cells; H<sub>2</sub>O<sub>2</sub>: hydrogen peroxide; *ompT*: outer membrane protease T; PBS: Phosphate Buffer Saline; ANN: Neural Network, AMPs: Antimicrobial Peptides; RT-PCR: transcription-polymerase chain reaction; CAI: the Codon Adaptation Index; SEM: Scanning electron microscopy; GelMA: methylpropylene gelatin hydrogel; ROS: oxygen species; PI: Proidium Iodide; DAPI: 4', 6-diaminidine -2 phenylindole; LB: Luria-Bertani; RBS: Ribosome Binding Site; MALDI-TOF-TOF: the matrix-assisted laser desorption ionization-tandem-time-of-flight; LB-G: LB medium with a final concentration of 0.5% glucose; TTC: 2,3,5-Triphenyltetrazolium chloride.

## References

1. Liu, P.; Li, W.; Peng, Y.; Han, S.; Liang, Z.; Cen, Y.; Li, X.; Wang, P.; Lv, H.; Zhang, Q.; Chen, H.; Lin, J. Molecular cloning, expression, and functional analysis of a putative lectin from the pearl oyster (*Pinctada fucata*, Gould 1850). *Fish Shellfish Immunol.* **2023**, *143*, 109215.