

Supplementary Information

Table S1 Culture conditions for microorganisms

Microorganism	Broth	Incubation Temperature
<i>A. oryzae</i>	Potato Dextrose Agar (PDA)	30 °C
<i>R. oligosporus</i>		
<i>S. cerevisiae</i>	Yeast Peptone Dextrose (YPD) broth	30 °C
<i>B. subtilis</i>	Luria-Bertani (LB) broth	30 °C
<i>L. plantarum</i>	de Man, Rogosa, and Sharpe (MRS) broth	37 °C
<i>L. sakei</i>		

Table S2 Free amino acids contents (mg/mL) of the fermented prawn juice using different microorganisms

Amino Acids	AO					RO				SC			
	D0	D1	D2	D3	D5	D1	D2	D3	D5	D1	D2	D3	D5
PHE	0.19 ±0.002	0.18 ±0.01	0.20 ±0.01	0.26 ±0.02	0.23 ±0.01	0.19 ±0.01	0.20 ±0.02	0.28 ±0.04	0.35 ±0.01	0.22 ±0.03	0.19 ±0.01	0.25 ±0.02	0.25 ±0.02

Microbial-Dependent Variations in Umami Compounds during Fermentation of Prawn By-Products

LEU	0.31 ±0.01	0.30 ±0.004	0.32 ±0.02	0.39 ±0.03	0.29 ±0.18	0.31 ±0.02	0.32 ±0.01	0.38 ±0.08	0.37 ±0.23	0.32 ±0.04	0.30 ±0.02	0.37 ±0.02	0.26 ±0.13
ILE	0.17 ±0.01	0.17 ±0.003	0.18 ±0.01	0.21 ±0.01	0.22 ±0.02	0.18 ±0.004	0.17 ±0.01	0.25 ±0.04	0.29 ±0.05	0.20 ±0.01	0.16 ±0.01	0.20 ±0.01	0.19 ±0.02
MET	0.11 ±0.001	0.11 ±0.001	0.11 ±0.005	0.15 ±0.01	0.12 ±0.03	0.11 ±0.01	0.11 ±0.004	0.13 ±0.04	0.14 ±0.04	0.11 ±0.01	0.10 ±0.01	0.14 ±0.01	0.11 ±0.02
TYR	0.25 ±0.004	0.25 ±0.001	0.19 ±0.02	0.20 ±0.10	0.14 ±0.12	0.25 ±0.02	0.20 ±0.01	0.26 ±0.06	0.19 ±0.10	0.27 ±0.05	0.18 ±0.01	0.13 ±0.06	ND
PRO	0.17 ±0.001	0.16 ±0.002	0.17 ±0.005	0.26 ±0.01	0.23 ±0.13	0.17 ±0.01	0.16 ±0.05	0.21 ±0.13	0.27 ±0.15	0.19 ±0.02	0.17 ±0.02	0.27 ±0.01	0.22 ±0.11
VAL	0.18 ±0.003	0.18 ±0.002	0.17 ±0.002	0.23 ±0.03	0.23 ±0.04	0.19 ±0.02	0.18 ±0.01	0.26 ±0.04	0.30 ±0.09	0.21 ±0.03	0.18 ±0.001	0.23 ±0.03	0.17 ±0.01
ALA	0.38 ±0.01	0.36 ±0.02	0.33 ±0.003	0.39 ±0.02	0.16 ±0.04	0.38 ±0.03	0.31 ±0.08	0.45 ±0.08	0.18 ±0.04	0.41 ±0.05	0.33 ±0.01	0.38 ±0.01	0.14 ±0.03
THR	0.15 ±0.003	0.15 ±0.003	0.14 ±0.01	0.20 ±0.01	0.14 ±0.02	0.16 ±0.01	0.15 ±0.01	0.2 ±0.03	0.19 ±0.03	0.16 ±0.02	0.13 ±0.004	0.16 ±0.01	0.10 ±0.002
GLY	0.28 ±0.002	0.27 ±0.01	0.24 ±0.01	0.37 ±0.03	0.22 ±0.15	0.27 ±0.03	0.25 ±0.004	0.27 ±0.24	0.26 ±0.23	0.31 ±0.05	0.24 ±0.01	0.38 ±0.02	0.20 ±0.16
SER	0.11 ±0.002	0.10 ±0.01	0.06 ±0.03	0.06 ±0.03	0.02 ±0.03	0.11 ±0.02	0.07 ±0.04	0.09 ±0.05	0.02 ±0.04	0.12 ±0.01	0.03 ±0.05	0.01 ±0.01	ND
HIS	0.12 ±0.001	0.11 ±0.001	0.09 ±0.002	0.15 ±0.01	0.18 ±0.06	0.11 ±0.01	0.09 ±0.01	0.18 ±0.03	0.22 ±0.05	0.11 ±0.01	0.08 ±0.004	0.15 ±0.01	0.15 ±0.06
ARG	0.42 ±0.01	0.27 ±0.23	0.03 ±0.04	ND	ND	0.09 ±0.04	0.08 ±0.06	ND	ND	0.40 ±0.05	0.08 ±0.06	ND	ND
LYS	1.34 ±0.12	1.27 ±0.12	0.53 ±0.02	0.96 ±0.09	1.11 ±0.29	1.46 ±0.50	0.54 ±0.02	1.07 ±0.15	1.23 ±0.32	1.29 ±0.13	0.50 ±0.05	1.00 ±0.09	0.96 ±0.10
GLU	0.03 ±0.003	0.03 ±0.01	0.12 ±0.02	0.28 ±0.05	0.40 ±0.08	0.03 ±0.01	0.12 ±0.01	0.37 ±0.07	0.49 ±0.16	0.03 ±0.002	0.1 ±0.01	0.31 ±0.02	0.34 ±0.04
Cys	ND	0.01 ±0.001	0.01 ±0.002	0.02 ±0.003	0.02 ±0.01	0.01 ±0.002	0.01 ±0.001	0.02 ±0.01	0.07 ±0.04	0.01 ±0.002	0.01 ±0.001	0.02 ±0.002	0.02 ±0.004
ASP	0.08 ±0.01	0.07 ±0.003	0.11 ±0.01	0.24 ±0.04	0.32 ±0.04	0.08 ±0.004	0.12 ±0.01	0.07 ±0.02	0.27 ±0.11	0.09 ±0.01	0.10 ±0.01	0.20 ±0.01	0.13 ±0.05

Microbial-Dependent Variations in Umami Compounds during Fermentation of Prawn By-Products

Amino Acids	BS				LP				LS			
	D1	D2	D3	D5	D1	D2	D3	D5	D1	D2	D3	D5
PHE	0.17 ±0.01	0.17 ±0.02	0.20 ±0.08	0.24 ±0.03	0.18 ±0.01	0.19 ±0.01	0.22 ±0.02	0.26 ±0.03	0.17 ±0.001	0.19 ±0.01	0.23 ±0.02	0.24 ±0.02
LEU	0.28 ±0.02	0.28 ±0.01	0.35 ±0.05	0.31 ±0.16	0.29 ±0.02	0.31 ±0.02	0.40 ±0.08	0.40 ±0.03	0.28 ±0.01	0.30 ±0.02	0.35 ±0.02	0.37 ±0.03
ILE	0.17 ±0.01	0.15 ±0.01	0.19 ±0.04	0.23 ±0.01	0.17 ±0.01	0.16 ±0.01	0.22 ±0.05	0.21 ±0.002	0.17 ±0.01	0.17 ±0.01	0.18 ±0.01	0.21 ±0.01
MET	0.10 ±0.003	0.10 ±0.01	0.12 ±0.04	0.12 ±0.03	0.10 ±0.01	0.10 ±0.005	0.14 ±0.03	0.13 ±0.01	0.10 ±0.003	0.10 ±0.01	0.13 ±0.01	0.13 ±0.01
TYR	0.22 ±0.01	0.17 ±0.01	0.19 ±0.05	0.15 ±0.13	0.22 ±0.02	0.18 ±0.01	0.25 ±0.01	0.24 ±0.02	0.21 ±0.01	0.17 ±0.03	0.19 ±0.05	0.17 ±0.04
PRO	0.15 ±0.005	0.14 ±0.03	0.21 ±0.13	0.25 ±0.13	0.16 ±0.01	0.19 ±0.01	0.32 ±0.05	0.34 ±0.02	0.15 ±0.001	0.18 ±0.01	0.29 ±0.03	0.31 ±0.02
VAL	0.17 ±0.01	0.18 ±0.02	0.21 ±0.03	0.17 ±0.01	0.18 ±0.01	0.17 ±0.002	0.20 ±0.02	0.25 ±0.02	0.17 ±0.01	0.16 ±0.001	0.18 ±0.02	0.19 ±0.03
ALA	0.32 ±0.02	0.27 ±0.05	0.38 ±0.03	0.17 ±0.02	0.35 ±0.03	0.28 ±0.05	0.40 ±0.07	0.18 ±0.01	0.33 ±0.02	0.31 ±0.02	0.29 ±0.09	0.14 ±0.02
THR	0.13 ±0.003	0.12 ±0.01	0.17 ±0.04	0.14 ±0.02	0.15 ±0.01	0.14 ±0.01	0.17 ±0.02	0.17 ±0.02	0.14 ±0.01	0.15 ±0.01	0.17 ±0.01	0.14 ±0.01
GLY	0.24 ±0.02	0.22 ±0.01	0.25 ±0.19	0.2 ±0.17	0.25 ±0.02	0.24 ±0.01	0.38 ±0.07	0.32 ±0.02	0.24 ±0.01	0.23 ±0.01	0.33 ±0.02	0.30 ±0.02
SER	0.08 ±0.01	0.06 ±0.03	0.07 ±0.03	ND	0.06 ±0.01	0.06 ±0.01	0.03 ±0.01	0.06 ±0.02	0.07 ±0.002	0.04 ±0.02	ND	ND
HIS	0.09 ±0.01	0.08 ±0.01	0.16 ±0.04	0.16 ±0.04	0.09 ±0.004	0.06 ±0.003	0.14 ±0.03	0.13 ±0.01	0.09 ±0.003	0.07	0.13 ±0.02	0.13 ±0.01

Microbial-Dependent Variations in Umami Compounds during Fermentation of Prawn By-Products

	±0.004											
ARG	0.32 ±0.05	0.20 ±0.11	0.23 ±0.16	0.10 ±0.12	0.32 ±0.04	0.26 ±0.03	0.40 ±0.05	0.37 ±0.02	ND	ND	ND	ND
LYS	1.00 ±0.15	0.47 ±0.01	1.00 ±0.18	1.03 ±0.11	1.10 ±0.17	0.39 ±0.05	1.02 ±0.38	1.11 ±0.12	0.88 ±0.10	0.44 ±0.05	0.83 ±0.12	0.95 ±0.07
GLU	0.03 ±0.001	0.10 ±0.03	0.28 ±0.07	0.33 ±0.05	0.03 ±0.001	0.10 ±0.004	0.32 ±0.01	0.34 ±0.03	0.03 ±0.001	0.09 ±0.01	0.29 ±0.05	0.37 ±0.01
Cys	0.01 ±0.002	0.01 ±0.001	0.01 ±0.01	0.01 ±0.01	ND	ND	0.01 ±0.003	0.01 ±0.002	0.01 ±0.001	0.01 ±0.001	0.02 ±0.002	0.02 ±0.001
ASP	0.07 ±0.01	0.09 ±0.001	0.18 ±0.02	0.22 ±0.02	0.07 ±0.01	0.11 ±0.01	0.26 ±0.03	0.34 ±0.02	0.06 ±0.003	0.11 ±0.01	0.22 ±0.01	0.30 ±0.02

*N = 3 fermentation trials

*Mean values ± standard deviation

*Ala – alanine, Arg – arginine, Asp – Aspartic acid, Cys – Cystine, Glu – glutamic acid, Gly – glycine, His – histidine, Ile – Isoleucine, Leu – leucine, Lys – lysine,

Met – methionine, Phe – phenylalanine, Pro – proline, Ser – serine, Thr – threonine, Tyr – Tyrosine, Val – valine

*ND (not detected, < limit of quantification)

Microbial-Dependent Variations in Umami Compounds during Fermentation of Prawn By-Products

*AO – *Aspergillus oryzae*, RO – *Rhizopus oligosporus*, SC – *Saccharomyces cerevisiae*, BS – *Bacillus subtilis*, LP – *Lactiplantibacillus plantarum*, LS –

Latilactobacillus sakei

Microbial-Dependent Variations in Umami Compounds during Fermentation of Prawn By-Products