

Supplementary data related to the article

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Tab. S1. Volatile compounds identified in blank models.

Compound	SAA					SSU			MAA	MSU
	Phe	Leu	Ile	Lys	Arg	GLU	GAL	ARA		
	[μg·kg ⁻¹]									
3-Methylbutanal	ND	15 ± 0.4	ND	ND	ND	ND	ND	ND	ND	ND
Benzeneacetaldehyde	16 ± 1.6 ^b	ND	ND	ND	ND	ND	ND	ND	32 ± 0.4 ^a	ND
Benzaldehyde	39 ± 0.3 ^a	ND	ND	ND	ND	ND	ND	ND	19 ± 0.4 ^b	ND
2-Piperidinone	ND	ND	ND	620 ± 35.9 ^a	ND	ND	ND	ND	192 ± 1.4 ^b	ND
2,3-Dihydro-3,5-dihydroxy-6-methyl-4H-pyran-4-one	ND	ND	ND	ND	ND	4 ± 0.1 ^c	119 ± 2.5 ^b	ND	ND	272 ± 16.0 ^a
2,5-Dimethylfuran-3,4(2H,5H)-dione	ND	ND	ND	ND	ND	ND	ND	ND	ND	20 ± 3.3
3,5-Dihydroxy-2-methyl-4H-Pyran-4-one	ND	ND	ND	ND	ND	ND	ND	ND	ND	173 ± 10.4
3-Hydroxy-3-methyl-2-butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Hydroxy-5-methylfuran-3(2H)-one	ND	ND	ND	ND	ND	ND	6 ± 2.6 ^c	112 ± 16.0 ^b	ND	251 ± 33.9 ^a
5-Methyl-2-furanmethanol	ND	ND	ND	ND	ND	ND	ND	ND	ND	19 ± 5.2
Benzoic acid	98 ± 0.2 ^b	ND	ND	ND	ND	ND	ND	ND	55 ± 4.7 ^a	ND
Benzeneacetic acid	439 ± 5.9 ^a	ND	ND	ND	ND	ND	ND	ND	237 ± 13.7 ^b	ND

Different lowercase letters in superscript indicate significant differences in the contents of the same volatile compound (*P* < 0.05). One-way analysis of variance (ANOVA) with Tukey's post-hoc test or T-test was performed using SPSS 23 software (IBM, Armonk, New York, USA) to analyse significant differences (*P* < 0.05, two-tailed).
SAA – single amino acid, SSU – single sugar, MAA – mixed amino acid, MSU – mixed sugar, GLU – D-glucose, GAL – D-galactose, ARA – D-arabinose, ND – not determined.

Tab. S2. Volatile compounds identified in dried shrimp and reaction models.

Compound	Dried shrimp	SAA + MSU					SSU + MAA			TL	MAA + MSU	TL + MAA	TL + MSU	TL + MAA + MSU
		Phe + MSU	Leu + MSU	Ile + MSU	Lys + MSU	Arg + MSU	GLU + MAA	ARA + MAA	GAL + MAA					
	[µg·kg ⁻¹]													
Pyrazines														
2,3,5-Trimethylpyrazine	158 ± 14.5 ^a	ND	ND	2 ± 0.0 ^c	52 ± 4.1 ^b	22 ± 1.9	74 ± 12.5 ^b	50 ± 5.4 ^b	77 ± 2.1 ^b	ND	67 ± 11.8 ^b	ND	ND	145 ± 17.1 ^a
2,3-Dimethylpyrazine	6 ± 0.3 ^b	ND	ND	ND	6 ± 0.4 ^b	7 ± 0.9 ^b	9 ± 2.9 ^b	7 ± 1.9 ^b	ND	ND	56 ± 7.9 ^a	ND	ND	52 ± 9.4 ^a
2,5-Dimethyl-3-(2-methylbutyl)pyrazine	2 ± 0.1 ^e	ND	ND	ND	52 ± 2.6 ^c	61 ± 4.3 ^c	108 ± 16.9 ^b	28 ± 0.5 ^d	46 ± 5.1 ^c	ND	103 ± 2.3 ^b	ND	ND	158 ± 7.2 ^a
2,5-Dimethyl-3-propylpyrazine	1 ± 0.1 ^d	ND	ND	ND	12 ± 1.1 ^b	22 ± 5.4 ^a	4 ± 0.1 ^c	ND	ND	ND	11 ± 0.2 ^b	ND	ND	10 ± 0.6 ^b
2,5-Dimethylpyrazine	175 ± 8.6 ^b	4 ± 1.0 ^f	4 ± 0.9 ^f	5 ± 1.3 ^f	93 ± 0.7 ^d	128 ± 11.5	134 ± 6.7 ^c	85 ± 2.1 ^d	133 ± 1.4 ^c	22 ± 0.8 ^e	158 ± 14.7 ^b	36 ± 3.6 ^e	35 ± 3.4 ^e	246 ± 28.9 ^a
2,6-Diethylpyrazine	1 ± 0.0 ^e	ND	ND	ND	4 ± 0.0 ^d	1 ± 0.3 ^e	10 ± 1.3 ^a	6 ± 0.4 ^b	ND	ND	5 ± 0.8 ^c	ND	ND	7 ± 0.1 ^b
2,6-Dimethylpyrazine	13 ± 1.2 ^b	2 ± 0.2 ^d	5 ± 0.7 ^c	5 ± 0.7 ^c	4 ± 1.0 ^c	19 ± 1.4 ^b	11 ± 2.8 ^b	8 ± 2.5 ^{bc}	19 ± 1.7 ^b	ND	125 ± 18.8 ^a	ND	ND	126 ± 9.3 ^a
2-Acetyl-3-methylpyrazine	4 ± 0.6 ^f	6 ± 2.2 ^f	ND	ND	35 ± 1.3 ^{cd}	31 ± 1.3 ^{cd}	41 ± 3.3 ^c	21 ± 0.4 ^e	36 ± 1.9 ^{cd}	ND	54 ± 2.3 ^b	ND	ND	63 ± 3.1 ^a
2-Ethyl-3,6-dimethylpyrazine	87 ± 1.8 ^c	18 ± 2.4 ^d	ND	2 ± 0.4 ^e	292 ± 10.3 ^a	225 ± 7.2 ^b	79 ± 8.0 ^c	103 ± 1.7 ^c	78 ± 5.1 ^c	ND	181 ± 24.6 ^b	ND	ND	296 ± 16.3 ^a
2-Ethyl-5-methylpyrazine	23 ± 0.5 ^c	ND	ND	ND	6 ± 0.4 ^d	11 ± 2.1 ^d	44 ± 1.7 ^b	43 ± 8.5 ^b	21 ± 0.2 ^c	ND	33 ± 4.1 ^{bc}	ND	ND	63 ± 0.8 ^a
Tetramethylpyrazine	5 ± 0.9 ^c	ND	ND	ND	8 ± 0.6 ^b	9 ± 0.3 ^b	9 ± 0.4 ^b	ND	ND	ND	15 ± 0.8 ^a	ND	ND	18 ± 0.5 ^a
2-Methylpyrazine	14 ± 1.6 ^d	ND	5 ± 1.7 ^e	3 ± 0.9 ^e	11 ± 2.6 ^{cd}	33 ± 1.8 ^c	37 ± 1.3 ^c	9 ± 1.3 ^d	20 ± 2.9 ^d	ND	123 ± 16.0 ^b	ND	ND	197 ± 22.6 ^a
2-Acetylpyrazine	3 ± 1.2 ^d	5 ± 1.6 ^{cd}	ND	ND	20 ± 0.4 ^b	25 ± 3.5 ^b	8 ± 2.2 ^c	ND	9 ± 1.3 ^c	ND	54 ± 3.5 ^a	ND	ND	75 ± 10.3 ^a
2,3-Dimethyl-5-n-propylpyrazine	1 ± 0.2 ^d	ND	ND	ND	ND	ND	47 ± 8.4 ^c	100 ± 2.7 ^b	76 ± 12.5 ^b	ND	144 ± 4.2 ^a	ND	ND	159 ± 9.8 ^a
2-Ethyl-6-methylpyrazine	5 ± 0.5 ^b	ND	ND	ND	1 ± 0.2 ^c	3 ± 0.7 ^c	6 ± 0.4 ^b	ND	5 ± 0.1 ^b	ND	19 ± 2.5 ^a	ND	ND	17 ± 0.3 ^a
3,5-Diethyl-2-methylpyrazine	6 ± 0.3 ^b	ND	ND	ND	57 ± 0.8 ^a	ND	6 ± 0.9 ^b	7 ± 1.1 ^b	ND	ND	ND	ND	ND	ND
2,5-Dimethyl-3-(3-methylbutyl)pyrazine	20 ± 1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Ethenyl-6-methylpyrazine	20 ± 1.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Isoamyl-6-methylpyrazine	2 ± 0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methyl-6-(1-propenyl)pyrazine	18 ± 1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,3,5-Trimethyl-6-ethylpyrazine	6 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-(1-Methylpropyl)pyrazine	ND	9 ± 3.2 ^c	ND	4 ± 0.7 ^c	290 ± 16.7 ^a	227 ± 2.2 ^a	62 ± 3.1 ^b	ND	50 ± 7.4 ^b	ND	47 ± 8.1 ^b	ND	ND	69 ± 3.4 ^b
2-Acetyl-3,5-dimethylpyrazine	1 ± 0.1 ^d	ND	ND	ND	ND	ND	5 ± 0.7 ^c	ND	8 ± 2.3 ^b	ND	ND	ND	ND	13 ± 0.9 ^a
2-Ethenyl-6-methylpyrazine	ND	5 ± 0.3 ^c	6 ± 1.0 ^c	19 ± 1.4 ^b	ND	ND	6 ± 0.1 ^c	ND	ND	ND	5 ± 0.7 ^c	ND	ND	59 ± 10.6 ^a

Tab. S2. continued

Compound	Dried shrimp	SAA + MSU					SSU + MAA			TL	MAA + MSU	TL + MAA	TL + MSU	TL + MAA + MSU
		Phe + MSU	Leu + MSU	Ile + MSU	Lys + MSU	Arg + MSU	GLU + MAA	ARA + MAA	GAL + MAA					
	[μg·kg ⁻¹]													
2-Ethyl-3,5-dimethylpyrazine	ND	ND	ND	ND	45 ± 0.3 ^a	ND	ND	ND	8 ± 2.6 ^b	ND	ND	ND	ND	ND
2-Ethylpyrazine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13 ± 3.1 ^b	ND	ND	25 ± 3.2 ^a
2-Hydroxymethyl-5-methylpyrazine	ND	ND	ND	ND	23 ± 0.9 ^a	2 ± 0.3 ^b	ND	ND	ND	ND	ND	ND	ND	ND
2-Methyl-3-isopropylpyrazine	ND	ND	8 ± 0.7 ^b	ND	ND	ND	36 ± 4.7 ^a	5 ± 0.4 ^b	ND	ND	3 ± 0.4 ^b	ND	ND	37 ± 1.8 ^a
2-Methyl-5-propylpyrazine	ND	17 ± 1.7 ^b	2 ± 0.0 ^d	3 ± 0.4 ^{cd}	40 ± 1.6 ^a	17 ± 2.6 ^b	5 ± 0.9 ^c	ND	16 ± 0.6 ^b	ND	5 ± 0.4 ^c	ND	ND	ND
Aldehydes														
2-Methylbutanal	27 ± 3.2 ^e	ND	ND	231 ± 22.1 ^b	ND	ND	93 ± 6.4 ^c	65 ± 4.1 ^d	63 ± 6.5 ^d	ND	72 ± 6.3 ^d	ND	ND	354 ± 7.3 ^a
3-Methylbutanal	35 ± 5.2 ^d	ND	184 ± 11.0 ^b	ND	ND	ND	64 ± 3.6 ^c	45 ± 2.9 ^{cd}	45 ± 3.7 ^{cd}	ND	56 ± 7.1 ^c	ND	ND	234 ± 15.2 ^a
Benzaldehyde	29 ± 0.7 ^d	186 ± 4.1 ^a	ND	ND	ND	ND	116 ± 19.5 ^b	132 ± 3.5 ^b	92 ± 11.2 ^{bc}	ND	85 ± 3.3 ^c	105 ± 14.1 ^b	ND	182 ± 15.1 ^a
Pentanal	27 ± 0.9 ^b	ND	ND	ND	ND	ND	ND	ND	ND	37 ± 2.7 ^a	ND	ND	ND	14 ± 2.4 ^c
Hexanal	2 ± 0.4 ^c	ND	ND	ND	ND	ND	ND	ND	ND	9 ± 0.5 ^b	ND	ND	ND	15 ± 1.3 ^a
2-Phenylpropenal	3 ± 0.7 ^d	11 ± 2.9 ^b	2 ± 0.3 ^d	ND	ND	ND	9 ± 0.5 ^c	ND	ND	11 ± 1.3 ^b	9 ± 1.3 ^b	ND	ND	17 ± 2.3 ^a
Decanal	ND	ND	ND	2 ± 0.6 ^d	ND	ND	7 ± 0.4 ^c	ND	5 ± 0.4 ^{cd}	13 ± 1.3 ^b	ND	ND	ND	38 ± 5.5 ^a
Octanal	1 ± 0.3 ^c	ND	ND	ND	ND	ND	ND	ND	ND	15 ± 2.8 ^b	ND	ND	ND	38 ± 3.2 ^a
(E)-2-Decenal	ND	ND	ND	ND	ND	ND	ND	ND	ND	29 ± 5.1	ND	ND	ND	ND
(E)-4-Decenal	ND	ND	ND	ND	ND	ND	ND	ND	ND	26 ± 1.5 ^b	ND	ND	ND	72 ± 8.3 ^a
3-Furaldehyde	ND	2 ± 0.5 ^c	4 ± 1.4 ^{bc}	7 ± 0.6 ^b	ND	ND	ND	ND	ND	ND	12 ± 1.3 ^a	ND	ND	ND
5-Methyl-2-phenylhex-2-enal	ND	61 ± 9.9 ^c	ND	ND	ND	ND	176 ± 12.5 ^b	37 ± 2.5 ^c	74 ± 3.6 ^c	ND	8 ± 1.6 ^d	ND	ND	373 ± 20.8 ^a
Benzeneacetaldehyde	ND	311 ± 6.9 ^a	ND	ND	ND	ND	77 ± 6.9 ^c	ND	ND	ND	190 ± 9.6 ^b	ND	ND	354 ± 25.6 ^a
Nonanal	ND	ND	ND	ND	ND	ND	ND	ND	ND	88 ± 5.0 ^b	ND	ND	ND	141 ± 18.5 ^a
Tetradecanal	ND	ND	ND	ND	ND	ND	ND	ND	ND	83 ± 1.5 ^b	ND	ND	ND	145 ± 1.5 ^a
Ketones														
2,3-Dihydro-3,5-dihydroxy-6-methyl-4H-pyran-4-one	13 ± 1.6 ^e	488 ± 14.5 ^a	123 ± 3.4 ^c	83 ± 4.9 ^d	19 ± 1.3 ^e	15 ± 2.9 ^e	192 ± 19.8 ^b	ND	145 ± 10.4 ^c	ND	79 ± 5.3 ^d	ND	89 ± 2.6 ^d	265 ± 14.9 ^b
2-Heptanone	6 ± 1.2 ^b	ND	ND	ND	ND	ND	ND	ND	ND	3 ± 0.6 ^b	ND	ND	ND	98 ± 5.5 ^a
2-Decanone	7 ± 0.3 ^b	ND	ND	ND	ND	ND	ND	ND	ND	21 ± 3.6 ^a	ND	29 ± 4.3 ^a	ND	21 ± 3.2 ^a
2-Nonanone	9 ± 2.1 ^c	ND	ND	ND	ND	ND	ND	ND	ND	21 ± 2.8 ^b	ND	23 ± 5.7 ^{ab}	34 ± 5.68 ^a	4 ± 0.3 ^c
2-Octanone	5 ± 0.3 ^b	ND	ND	ND	ND	ND	ND	ND	ND	31 ± 0.0 ^a	ND	37 ± 1.6 ^a	ND	5 ± 0.6 ^b
2,5-Dimethylfuran-3,4(2H,5H)-dione	1 ± 0.1 ^d	33 ± 3.1 ^a	ND	14 ± 1.0 ^c	ND	23 ± 4.4 ^b	ND	ND	ND	ND	ND	ND	ND	ND
2-Pyrrolidinone	3 ± 0.2 ^c	ND	ND	ND	ND	ND	ND	ND	ND	3 ± 0.9 ^c	15 ± 0.3 ^a	15 ± 0.1 ^a	ND	9 ± 0.9 ^b
2-Piperidinone	4 ± 0.1 ^d	ND	ND	ND	660 ± 52.7 ^a	ND	153 ± 11.3 ^d	164 ± 7.8 ^d	148 ± 6.5 ^d	ND	256 ± 2.3 ^c	397 ± 11.9 ^b	ND	169 ± 13.2 ^d
2-Undecanone	2 ± 0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5-Methyl-2-hexanone	7 ± 0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-Geranyl acetone	1 ± 0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,3-Octandione	ND	ND	ND	ND	ND	ND	ND	ND	ND	14 ± 1.3 ^b	ND	ND	ND	50 ± 3.7 ^a
2-Methyl-3-octanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	20 ± 2.3 ^b	ND	ND	ND	31 ± 4.6 ^a
3,5-Dihydroxy-2-methyl-4H-pyran-4-one	ND	145 ± 14.5 ^a	7 ± 2.3 ^c	42 ± 0.7 ^b	ND	ND	37 ± 2.3 ^b	ND	ND	ND	ND	ND	ND	ND
3-Hydroxy-3-methyl-2-butanone	ND	ND	ND	ND	ND	ND	ND	26 ± 1.3	ND	ND	ND	ND	ND	ND
3-Tridecanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	4 ± 1.5 ^b	ND	10 ± 0.7 ^a	3 ± 0.00 ^b	ND
4-Hydroxy-5-methylfuran-3(2H)-one	ND	162 ± 9.0 ^a	11 ± 2.6	32 ± 9.4	ND	ND	ND	144 ± 9.6	ND	ND	ND	ND	ND	ND
Benzyl methyl ketone	ND	2 ± 0.6 ^c	ND	ND	ND	ND	11 ± 2.6 ^b	6 ± 0.5 ^c	18 ± 0.4 ^a	ND	ND	ND	ND	15 ± 1.2 ^a
Acetophenone	ND	ND	ND	ND	ND	ND	41 ± 5.0 ^c	82 ± 4.5 ^b	21 ± 1.2 ^d	ND	41 ± 8.8 ^c	ND	ND	106 ± 8.5 ^a
Furaneol	ND	ND	ND	ND	ND	ND	75 ± 8.3 ^a	ND	22 ± 4.7 ^b	ND	ND	ND	ND	ND
1-Hydroxy-2-propanone	ND	15 ± 1.8 ^b	8 ± 1.0 ^c	26 ± 2.0 ^a	ND	ND	20 ± 6.0 ^b	ND	ND	ND	ND	ND	ND	19 ± 0.7 ^b
6,10-Dimethyl-5,9-undecadien-2-one	ND	4 ± 1.0 ^d	6 ± 1.0 ^c	8 ± 1.0 ^b	2 ± 0.4 ^d	7 ± 0.0 ^c	7 ± 3.7 ^{bc}	12 ± 1.7 ^b	5 ± 0.8 ^c	4 ± 0.4 ^{cd}	36 ± 1.3 ^a	ND	ND	7 ± 1.0 ^{bc}
Alcohols														
1-Octen-3-ol	8 ± 0.6	ND	ND	ND	ND	ND	ND	ND	ND	6 ± 0.3	ND	ND	ND	ND
Benzylalcohol	4 ± 0.4 ^d	3 ± 1.0 ^d	ND	ND	ND	ND	11 ± 1.2 ^c	10 ± 3.5 ^c	21 ± 1.2 ^b	ND	13 ± 1.3 ^c	ND	ND	65 ± 2.5 ^a
2-Ethylhexanol	2 ± 0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tridecanol	1 ± 0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Butyn-1-ol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11 ± 1.32 ^b	24 ± 3.0 ^a
5-Methyl-2-furanmethanol	ND	50 ± 1.1 ^b	9 ± 1.3 ^c	45 ± 3.6 ^b	ND	ND	11 ± 2.5 ^c	ND	12 ± 0.1 ^c	ND	9 ± 1.2 ^c	ND	ND	112 ± 1.1 ^a
Furfuryl alcohol	ND	6 ± 1.7 ^b	3 ± 1.1 ^c	9 ± 1.6 ^a	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-containing compounds														
Trimethylamine	206 ± 15.4 ^a	ND	ND	ND	ND	2 ± 0.4 ^d	65 ± 1.3 ^b	4 ± 0.4 ^d	ND	ND	25 ± 2.4 ^c	ND	ND	ND
2-Acetyl-1-pyrroline	8 ± 0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Tab. S2. continued

Compound	Dried shrimp	SAA + MSU					SSU + MAA			TL	MAA + MSU	TL + MAA	TL + MSU	TL + MAA + MSU
		Phe + MSU	Leu + MSU	Ile + MSU	Lys + MSU	Arg + MSU	GLU + MAA	ARA + MAA	GAL + MAA					
	[μg·kg ⁻¹]													
2-Acetylpyridine	4 ± 0.3 ^b	28 ± 5.2 ^a	ND	5 ± 0.4 ^b	2 ± 0.3 ^c	4 ± 0.2 ^b	ND	ND	ND	ND	ND	ND	ND	6 ± 3.2 ^b
2-Acetylpyrrole	3 ± 0.4 ^b	ND	4 ± 0.4 ^a	2 ± 0.1 ^b	ND	1 ± 0.4 ^c	ND	ND	ND	ND	ND	ND	ND	ND
2-Phenylpyridine	ND	6 ± 0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4 ± 0.8
5-Methyl-2-phenylpyrimidine	ND	ND	ND	ND	ND	ND	12 ± 3.0 ^c	55 ± 6.7 ^a	26 ± 2.9 ^b	ND	ND	ND	ND	ND
Acetamide	ND	2 ± 0.0 ^d	ND	1 ± 0.1 ^d	3 ± 0.1 ^d	31 ± 5.3 ^b	21 ± 3.5 ^{bc}	18 ± 3.3 ^c	49 ± 1.1 ^a	ND	26 ± 1.6 ^b	ND	ND	45 ± 1.7 ^a
Formamide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3 ± 0.4	ND	ND	5 ± 0.3
Indole	ND	ND	ND	ND	ND	ND	ND	ND	ND	4 ± 0.2	ND	ND	ND	3 ± 0.4
N,N-Diethyl-2-propyn-1-amine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2 ± 0.8
Acids														
(E)-3-Decenoic acid	6 ± 0.4 ^c	ND	ND	ND	ND	ND	ND	ND	ND	15 ± 1.3 ^b	ND	ND	ND	44 ± 6.2 ^a
3-Methylbutanoic acid	9 ± 1.7 ^d	ND	51 ± 2.2 ^b	55 ± 0.7 ^b	ND	ND	ND	ND	ND	ND	18 ± 1.4 ^c	17 ± 3.0 ^c	ND	162 ± 11.5 ^a
Acetic acid	11 ± 0.4 ^h	197 ± 7.4 ^c	23 ± 4.3 ^g	25 ± 1.3 ^g	11 ± 5.0 ^h	14 ± 1.5 ^{gh}	250 ± 10.5 ^b	145 ± 3.7 ^d	128 ± 0.2 ^{de}	25 ± 2.1 ^g	101 ± 9.9 ^e	46 ± 0.3 ^f	40 ± 2.1 ^f	319 ± 14.8 ^a
Benzoic acid	1 ± 0.2 ^d	48 ± 3.9 ^a	ND	ND	ND	ND	18 ± 0.6 ^b	13 ± 3.1 ^{bc}	18 ± 1.8 ^b	ND	7 ± 0.5 ^c	5 ± 0.7 ^c	ND	13 ± 3.2 ^{bc}
Octanoic acid	2 ± 0.1 ^c	ND	ND	ND	ND	ND	ND	ND	ND	5 ± 0.9 ^b	3 ± 1.6 ^{bc}	ND	ND	13 ± 3.8 ^a
Decanoic acid	3 ± 0.3 ^c	ND	ND	ND	ND	ND	ND	ND	ND	7 ± 0.9 ^b	ND	ND	11 ± 1.0 ^b	35 ± 1.2 ^a
Diethylacetic acid	4 ± 0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexadecanoic acid	6 ± 0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentadecanoic acid	1 ± 0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetradecanoic acid	1 ± 0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trans-2-decenoic acid	6 ± 0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Methylpentanoic acid	ND	ND	ND	17 ± 0.6 ^b	ND	ND	17 ± 0.4 ^b	3 ± 0.0 ^c	ND	ND	24 ± 1.6 ^b	ND	ND	81 ± 16.6 ^a
4-Methylpentanoic acid	ND	ND	4 ± 0.9	ND	ND	ND	4 ± 0.4	ND	ND	ND	ND	ND	ND	ND
9-Decenoic acid	ND	ND	ND	ND	ND	ND	ND	ND	ND	12 ± 0.4 ^b	ND	ND	55 ± 3.6 ^a	4 ± 1.1 ^c
Benzeneacetic acid	ND	556 ± 63.9 ^a	ND	ND	ND	ND	37 ± 0.0 ^b	33 ± 3.6 ^b	23 ± 3.1 ^c	ND	19 ± 1.6 ^c	4 ± 0.1 ^d	ND	47 ± 2.1 ^b
Palmitic acid	ND	ND	ND	ND	ND	ND	ND	ND	ND	32 ± 1.7 ^b	ND	ND	111 ± 6.9 ^a	105 ± 11.9 ^a
Hydrocarbons														
Dodecane	23 ± 11.8 ^d	ND	ND	ND	ND	ND	ND	ND	ND	220 ± 2.8 ^a	ND	134 ± 14.6 ^b	150 ± 12.2 ^b	70 ± 0.1 ^c
Heptadecane	1 ± 0.2 ^d	ND	ND	ND	ND	ND	ND	ND	ND	19 ± 1.0 ^c	ND	33 ± 1.4 ^{ab}	43 ± 2.6 ^a	29 ± 2.3 ^b
Tetradecane	1 ± 0.3 ^c	ND	ND	ND	ND	ND	ND	ND	ND	49 ± 1.2 ^a	ND	59 ± 0.4 ^a	31 ± 1.4 ^b	26 ± 0.5 ^b
Tridecane	8 ± 2.1 ^b	ND	ND	ND	ND	ND	ND	ND	ND	8 ± 3.0 ^b	ND	60 ± 2.3 ^a	ND	52 ± 5.7 ^a
Undecane	9 ± 3.46 ^d	ND	ND	ND	ND	ND	ND	ND	ND	1 231 ± 21.4 ^c	ND	2 852 ± 41.5 ^b	3 223 ± 78.7 ^b	2 980 ± 69.3 ^a
2,6,10,14-Tetramethylpentadecane	3 ± 0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6,11-Trimethyltridecane	2 ± 0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Decane	5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentadecane	1 ± 0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	12 ± 3.3 ^b	ND	ND	ND	28 ± 2.4 ^a
1-Heptadecene	ND	ND	ND	ND	ND	ND	ND	ND	ND	12 ± 1.4 ^b	ND	52 ± 5.1 ^a	ND	14 ± 1.4 ^b
1-Tridecene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	33 ± 3.5	ND	29 ± 3.5
1-Undecene	ND	ND	ND	ND	ND	ND	ND	ND	ND	143 ± 7.7 ^a	ND	135 ± 2.7 ^a	135 ± 12.1 ^a	16 ± 0.42 ^b
2,3-Dimethylnonane	ND	ND	ND	ND	ND	ND	ND	ND	ND	50 ± 3.7 ^a	ND	55 ± 2.4 ^a	ND	24 ± 2.4 ^b
2,4-Dimethyldecane	ND	ND	ND	ND	ND	ND	ND	ND	ND	5 ± 0.6 ^b	ND	ND	ND	36 ± 6.9 ^a
2,6,11-Trimethyldodecane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7 ± 0.7 ^b	ND	25 ± 2.3 ^a
4,6-Dimethyldodecane	ND	ND	ND	ND	ND	ND	ND	ND	ND	31 ± 2.5 ^b	ND	38 ± 0.5 ^a	26 ± 2.3 ^c	31 ± 3.5 ^b
4,7-Dimethylundecane	ND	ND	ND	ND	ND	ND	ND	ND	ND	39 ± 3.7 ^a	ND	ND	ND	19 ± 1.0 ^b
4-Methyldodecane	ND	ND	ND	ND	ND	ND	ND	ND	ND	13 ± 1.3 ^b	ND	ND	29 ± 2.4 ^a	11 ± 0.5 ^b
4-Methyloctane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	29 ± 1.1
5-(1-Methylpropyl)nonane	ND	ND	ND	ND	ND	ND	ND	ND	ND	61 ± 1.6 ^b	ND	69 ± 8.6 ^b	86 ± 4.7 ^a	23 ± 2.1 ^c
5-Methyl-5-propylnonane	ND	ND	ND	ND	ND	ND	ND	ND	ND	12 ± 1.7 ^a	ND	15 ± 1.7 ^a	ND	7 ± 2.1 ^b
9-Methyl-1-undecene	ND	ND	ND	ND	ND	ND	ND	ND	ND	18 ± 1.8	ND	ND	24 ± 2.3	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	15 ± 1.9 ^c	132 ± 8.7 ^a	ND	110 ± 10.4 ^b

Different lowercase letters in superscript indicate significant differences in the contents of the same volatile compound ($P < 0.05$). One-way analysis of variance (ANOVA) with Tukey's post-hoc test was performed using SPSS 23 software (IBM, Armonk, New York, USA) to analyse significant differences ($P < 0.05$, two-tailed).

SAA – single amino acid, SSU – single sugar, MAA – mixed amino acid, MSU – mixed sugar, TL – total lipid, GLU – D-glucose, GAL – D-galactose, ARA – D-arabinose, ND – not determined.