

Supplementary Material:

Exploring the sub-lethal effects of plastic ingestion by shearwaters using fatty acid analysis

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Supplementary Table 1. Comparison of mean percentage Fatty Acid (FA) composition and standard deviation (\pm SD), including the total Saturated Fatty Acids (SFA), Monounsaturated (MUFA) and Polyunsaturated Fatty Acids (PUFA), between the soft tissues of fledgling short-tailed (*Ardenna tenuirostris*) and flesh-footed (*A. carneipes*) shearwaters collected in 2017.

	Short-tailed Shearwater (Great Dog Island, Tasmania)						Flesh-footed Shearwater (Lord Howe Island, New South Wales)					
	Adipose		Liver		Breast muscle		Adipose		Liver		Breast muscle	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
14:0	4.78	\pm 1.63	1.30	\pm 1.07	2.23	\pm 0.93	1.81	\pm 1.48	1.40	\pm 1.47	3.19	\pm 2.69
15:0	0.31	\pm 0.07	0.17	\pm 0.06	0.23	\pm 0.05	0.46	\pm 0.23	0.33	\pm 0.23	0.61	\pm 0.29
16:0	23.81	\pm 1.94	19.07	\pm 2.90	19.97	\pm 2.91	24.51	\pm 3.78	19.35	\pm 6.25	25.52	\pm 6.89
17:0	0.29	\pm 0.06	0.34	\pm 0.07	0.40	\pm 0.28	1.01	\pm 0.30	0.84	\pm 0.30	0.89	\pm 0.28
18:0	4.54	\pm 1.32	16.80	\pm 4.44	8.15	\pm 2.56	11.94	\pm 5.22	12.17	\pm 6.15	10.52	\pm 6.00
19:0	0.00	\pm 0.02	0.01	\pm 0.03	0.03	\pm 0.06	0.23	\pm 0.17	0.30	\pm 0.17	0.15	\pm 0.13
20:0	0.22	\pm 0.09	0.11	\pm 0.11	0.15	\pm 0.12	0.44	\pm 0.28	0.66	\pm 0.48	0.24	\pm 0.08
22:0	0.00	\pm 0.01	0.07	\pm 0.11	0.01	\pm 0.03	0.05	\pm 0.08	0.16	\pm 0.17	0.01	\pm 0.03
Σ_{SFA}	34.20	\pm 2.29	38.08	\pm 3.14	31.33	\pm 5.38	31.18	\pm 18.45	25.57	\pm 18.22	21.83	\pm 22.04
14:1	0.06	\pm 0.07	0.01	\pm 0.03	0.25	\pm 0.13	0.01	\pm 0.03	0.03	\pm 0.05	0.06	\pm 0.10
16:1a	0.29	\pm 1.04	0.00	\pm 0.00	0.03	\pm 0.05	0.14	\pm 0.15	0.24	\pm 0.29	0.14	\pm 0.14
16:1b	7.86	\pm 2.50	2.80	\pm 1.50	6.29	\pm 1.53	3.86	\pm 1.66	3.10	\pm 2.17	5.29	\pm 3.43
16:1c	0.28	\pm 0.18	0.14	\pm 0.16	0.27	\pm 0.19	0.06	\pm 0.10	0.02	\pm 0.04	0.03	\pm 0.06
17:1	0.22	\pm 0.13	0.02	\pm 0.05	0.11	\pm 0.16	0.40	\pm 0.24	0.23	\pm 0.19	0.38	\pm 0.27

18:1c	0.58 ± 0.21	0.21 ± 0.16	0.32 ± 0.14	0.07 ± 0.09	0.11 ± 0.07	0.04 ± 0.07
18:1n7	4.09 ± 0.71	3.41 ± 0.66	5.47 ± 0.62	4.37 ± 1.04	4.03 ± 1.62	4.12 ± 0.77
18:1n9	29.53 ± 2.44	19.80 ± 3.52	29.49 ± 1.77	30.28 ± 5.20	33.00 ± 8.04	26.22 ± 6.83
20:1a	3.44 ± 2.06	0.91 ± 0.65	2.68 ± 1.19	2.73 ± 2.22	7.67 ± 6.44	2.41 ± 1.33
20:1b	0.94 ± 1.55	0.55 ± 0.90	0.86 ± 1.76	0.38 ± 0.26	0.51 ± 0.37	0.22 ± 0.22
22:1a	1.60 ± 0.83	0.41 ± 0.35	0.72 ± 0.21	0.65 ± 0.63	1.80 ± 2.38	0.23 ± 0.22
22:1b	0.53 ± 0.31	0.21 ± 0.19	0.43 ± 0.14	0.28 ± 0.30	0.63 ± 0.68	0.14 ± 0.14
22:1c	0.08 ± 0.09	0.01 ± 0.03	0.01 ± 0.02	0.07 ± 0.16	0.11 ± 0.12	0.06 ± 0.11
24:1a	0.12 ± 0.10	0.07 ± 0.14	0.05 ± 0.07	0.02 ± 0.05	0.10 ± 0.16	0.05 ± 0.17
24:1b	0.21 ± 0.14	0.32 ± 0.42	0.14 ± 0.11	0.17 ± 0.26	0.57 ± 0.56	0.05 ± 0.10
∑MUFA	49.92 ± 2.74	28.90 ± 5.06	47.15 ± 1.92	31.42 ± 21.18	37.68 ± 26.62	20.77 ± 21.54
18:2n6	2.24 ± 0.37	1.40 ± 0.49	2.21 ± 0.53	1.57 ± 0.46	1.34 ± 0.40	1.69 ± 0.71
20:2n6	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.04	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
∑PUFA2	2.24 ± 0.37	1.40 ± 0.49	2.23 ± 0.53	1.13 ± 0.82	0.97 ± 0.70	0.89 ± 1.00
16:3n6	0.05 ± 0.07	0.00 ± 0.02	0.00 ± 0.00	0.01 ± 0.04	0.03 ± 0.06	0.01 ± 0.04
18:3n6	0.10 ± 0.05	0.01 ± 0.02	0.03 ± 0.04	0.03 ± 0.05	0.04 ± 0.08	0.02 ± 0.05
20:3n6	0.15 ± 0.05	0.42 ± 0.16	0.24 ± 0.08	0.03 ± 0.05	0.05 ± 0.11	0.01 ± 0.02
∑PUFA3	0.31 ± 0.15	0.44 ± 0.17	0.26 ± 0.09	0.02 ± 0.07	0.02 ± 0.06	0.11 ± 0.34
16:4n3	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.09 ± 0.08	0.11 ± 0.11	0.12 ± 0.13
18:4n3	0.81 ± 0.30	0.14 ± 0.15	0.24 ± 0.20	0.12 ± 0.17	0.12 ± 0.24	0.20 ± 0.26
20:4n3	0.37 ± 0.13	0.24 ± 0.08	0.37 ± 0.12	0.26 ± 0.18	0.25 ± 0.23	0.32 ± 0.21
20:4n6	0.31 ± 0.07	7.41 ± 2.00	1.62 ± 0.54	3.42 ± 2.68	3.08 ± 3.03	4.83 ± 4.27
22:4n6	0.03 ± 0.12	0.03 ± 0.04	0.02 ± 0.04	0.16 ± 0.15	0.18 ± 0.10	0.25 ± 0.31
20:5n3	4.32 ± 1.50	8.68 ± 2.80	6.82 ± 1.89	2.00 ± 0.68	1.75 ± 1.31	2.93 ± 1.62
22:5n3	0.71 ± 0.12	0.70 ± 0.14	0.95 ± 0.33	1.06 ± 0.57	0.88 ± 0.70	0.95 ± 0.48
22:5n6	0.28 ± 1.14	0.01 ± 0.04	0.00 ± 0.00	0.21 ± 0.15	0.14 ± 0.11	0.17 ± 0.15
22:6n3	6.21 ± 1.95	13.80 ± 3.45	8.83 ± 2.57	6.61 ± 3.72	4.27 ± 2.51	7.33 ± 4.37

∑ values (i.e. ∑SFA) include unidentified FAs.

Supplementary Table 2. Percentage of ingested plastic by colour and type recovered from fledgling short-tailed (*Ardenna tenuirostris*) and flesh-footed (*A. carneipes*) shearwaters collected in 2017.

Species	Colour						Type					
	White	Blue	Green	Red	Yellow	Black	Nurdle/ Pellet	Foam	Thread	Sheet	Fragment	Other
Short-tailed Shearwater	65.91	3.41	17.05	0.00	0.00	13.64	18.18	0.00	1.14	1.14	79.55	0.00
Flesh-footed Shearwater	83.23	3.35	3.35	3.66	1.52	4.88	5.49	0.00	0.00	0.00	94.21	0.30*
*A	white	balloon	was	recovered	inside	the	proventriculus	of	one	bird		

Supplementary Table 3. Distribution of plastic in the digestive tracts of short-tailed (*Ardenna tenuirostris*) and flesh-footed (*A. carneipes*) shearwater fledglings in 2017. FO = frequency of occurrence (%)

Species	Proventriculus				Gizzard			
	Mean mass (g)	Mean number of items	Range	PercentageFO (%)	Mean mass (g)	Mean number of items	Range	PercentageFO (%)
Short-tailed Shearwater	0.0164 ± 0.255	1.00 ± 1.60	0 - 5	20.45	0.0597 ± 0.0750	4.12 ± 4.63	0 - 13	79.55
Flesh-footed Shearwater	3.0145 ± 6.4342	14.29 ± 26.88	0 - 113	73.64	0.0841 ± 0.0905	5.12 ± 5.66	0 - 19	26.36